

AMERICAN VETERINARY REVIEW.

DECEMBER, 1903.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, FRANCE, Oct. 15, 1903.

In my last chronicle I advanced the idea that in all probability steps would be taken by French veterinarians to express in a professional manifestation the affection and high esteem in which Prof. Nocard was held in his native country, and I spoke of the possibility of the creation of a committee to raise a fund to perpetuate for future ages the name of one who has done so much and who would have done much more had he lived, and who belonged to the veterinary profession.

At the time of my writing I was unaware that such arrangements had already taken place. The distance which separates me from my American friends is such that when news comes to me it takes so long to send it that by the time it appears in type it is quite stale.

At any rate, the veterinary profession of France has undertaken the work I alluded to; a committee has been appointed, and the following circular issued:

"SIR:—Some of the friends and students of Prof. Nocard have decided to raise a monument to the memory of the regretted maître.

"By the high value of his work, the importance of the services he has rendered, by the dignity of his life, Nocard is well worthy of this homage.

"We believe the monument ought to be erected at Alfort, near the laboratory where for twenty-five years he has worked without stopping, and realized so many important discoveries.

"We ask you to associate yourself with our undertaking by sending your donation to the subscription now open.

"THE COMMITTEE."

* * *

Of course, the committee is composed of the highest authorities in France belonging to the veterinary profession, Pasteur Institute, veterinary schools, etc. We regret that among the names we do not find those of intimate friends of Nocard, lovers of their profession, such as some of the members of the veterinary press, or from the army, or, again, from veterinary societies or schools of other countries, who would have exerted themselves in helping to swell the funds to be raised. But all those considerations are trifling, and may at an early date be properly arranged. The question to-day is this: A fund is to be raised; it is estimated that about five thousand (\$5000) dollars will be needed. Nearly fifteen hundred (\$1500) dollars have already been subscribed! Will not American veterinarians show their appreciation of the work done by one of their brotherhood, by Nocard, during his life, and will they fail to show their sorrow at the loss sustained?

All contributions addressed to the REVIEW or to myself will be duly credited and acknowledged.

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I suppose that, according to the instructions on the cover page of the REVIEW, that "European exchanges, books for review, etc., should be addressed to" me, it is proper for our staff to close up our bibliographical review and for me to fulfil my duties here. Not because the material for chronicling is wanting. Oh, no! but because, after all, bibliography is not altogether in its place in a special chapter, because in that chapter the subject is not always treated as it should be, and also because, after all, authors and publishers are always anxious to know what the opinion of the reviewer is. There is no doubt that his duty is not always pleasant, and that if he fulfils it properly, conscientiously and impartially, as he should do, the task may become hard and sometimes likely to modify feelings

of friendship between author and reviewer. But such is life, and, whatever may be the result, the work must be attended to.

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To-day I will try to write you a bibliographical review of French, American, and German works.

Why? Is it not a pretty heavy task? Authors from three different countries! No. The subjects treated of by the three authors are on the same topics—operative surgical technics. Indeed, we have "Operations—Cursus" of Wm. Pfeiffer, "Surgical and Obstetrical Operations" of W. L. Williams, and the "Précis de Chirurgie Vétérinaire" of P. J. Cadiot. All, with a somewhat different name, are written with the same object. The first two are for veterinary students and practitioners; the last has no special dedication.

When some years ago the exercises of Cadiot were published, when about the same time Pfeiffer's little work, and afterwards the copartnership book of Pfeiffer and Williams were issued, it seemed that the idea for such publications was rather a good one. Students were in need of a little guide, where, page by page, line by line, word by word almost, they could follow the technic of an operation and, so to speak, learn by heart the manipulations that would be required to be executed by the hands. But we fancy times are changing. The books are no longer guides; or, if they are, it is not in the same way. They are the direct and positive descriptions of the manner in which *one* operation should or must be performed, and out of this *modus operandi* there is no salvation. The technic described is the one tested by the author, and is the one he has selected as the best.

Of what uses, then, are the works on general operative surgery? Whatever descriptions they may give of a surgical operation are useless, so long as the author of the course to veterinary students does not give his sanction.

To a certain extent, however, and not to be too harsh on those who are attempting good work with excellent unselfish motives, those *vade mecums*, as I may call them, have a great

value; but their authors, it seems to me, reduce that value, or look for something else in addressing their works not only to students, but also to practitioners. I know that there is no age when one ceases to be a student, but we doubt if a practitioner of twenty, ten, five or less years can learn from the description of operations that are supposed to be at the fingers' end of every graduate of veterinary medicine at the time of his graduation, exception being allowed for those operations which are called new, and which, perhaps, have not been spoken of, written about, or demonstrated before.

But I think I am transgressing from the rights of a chronicler, and am rather too fully indulging in those of a critic, which, however, is done in good faith, and for which I tender my apologies.

* * *

Let us come back to our three works: (I) "*Operations—Cursus*," 3d edition, Prof. W. Pfeiffer. For Veterinarians and Students. It is divided into four chapters: (1) Tooth extraction, trephining, extirpation of the intermaxillary glands, ligation of Steno's duct, operation for entropion. (2) Operations on the guttural pouches, tracheotomy, intravenous injection, bleeding, ligation of the carotid, œsophagotomy. (3) Operations for cold abscess, Bayer's suture, thoracic and abdominal puncture, subcutaneous myotomy, amputation of the tail, castration of cryptorchids, removal of scirrhus cord, ovariectomy, urethrotomy, amputation of the penis. (4) Tenotomy of the flexor tendons, for springhalt, for patellar luxations, neurotomies, resection of the lateral cartilages of the os pedis, amputation of the claws of ruminants, Danish mode of casting.

The work is nicely printed and illustrated. It contains but little addition to the second edition.

* * *

(II) "*Surgical and Obstetrical Operations, for Veterinary Students and Practitioners*. By W. L. Williams, Professor of Obstetrics and Surgery in the New York State Veterinary College, Embodying Portions of the '*Operations—Cursus*' of Dr.

W. Pfeiffer, Professor of Veterinary Science in the University of Giessen." The work is gotten up in fine style and printed on paper to which veterinary publications are not accustomed. It is really too handsome. The student who will consult it at the surgical laboratory, while he is learning how to perform an operation, will be afraid of soiling the thick, fine, glossy paper he is handling. Yet it is a good move. The illustrations—well, so many seem to be reproductions of those of Dr. Pfeiffer that one would think they were printed from the same plates. Exceptions, however, are those that are essentially part of the addition made by Prof. Williams to the reproduction of the third edition of the German author, from which we regret our American friend has borrowed too much.

Williams' work is also divided into four chapters, with an addition. The first contains the same descriptions and plates as Williams produced, I believe, in the first edition of his work, but he has added his operation for poll-evil, the staphilotomy of McKillip, and his own trifacial neurotomy. The amputation of a piece of the ligamentum nuchæ in poll-evil is not new—far from it, even down to the scraping of the occipital bone, and of the vertebræ; but the incision on the median line, the drain through the thickness of the occipital bone—daring—and, well, dangerous as they may be, are, we believe, good additions to the work. Of course, with the staphilotomy and trifacial neurotomy our readers are well acquainted. Prof. Williams, in his second chapter, gives us, besides those of Dr. Pfeiffer, arytenectomy and intratracheal irrigations. In the third, among the additions we find caudal myectomy for gripping of the reins. It may not be out of place to object to the severe operation here described, when one much simpler, the plain subcutaneous caudal myotomy, will answer, and I fancy the unearthing of an old operation is scarcely a progress in veterinary surgery. In chapter four we find all the tenotomies and neurotomies, past and present, resection of the lateral cartilage (German operation), with the amputation of the claws of ruminants, and Bayer's suture. Those who have performed the extraction of a

piece of any portion of the wall (not undermined), after isolating it with one groove on each side of the wall and one at the sole, will, I think, ask themselves how can the semicircular piece of horn, spoken of in the operation for the resection of the lateral cartilage, be raised, isolated, and separated from the sensitive laminæ underneath, without tearing them and rendering the aspect of the smooth and regular stitched suture of Plate XXVIII rather a difficult problem? The last part of Williams' new work relates to obstetrical operations. I fear that I am not sufficiently competent to say anything on the subject; but I am sure it is a good part. I do not know if it is not the best, as it is essentially original, and the result of the practical efforts and observations of one who we all know is more than earnest and honest in all that he undertakes.

* * *

(III) "*Précis de Chirurgie Vétérinaire*," by P. J. Cadiot. This is no longer a little work, although, like the preceding ones, it is intended as a second edition to the "Exercices Hipiques" that our *confrère* Bitting translated some years ago. It is not addressed to practitioners, and yet its perusal would not be without interest to them. The "*Précis*" has modified the aspect that surgical exercises had. In it all and every operation is described; nothing else is given but the technics; and yet we find, from the means of restrictions, the simple operations, the special and general operations on the head, the neck, the trunk, the extremities, etc., freely enlarging its field; and afterwards in the same way the operations on cattle, swine and dogs. To simplify this review, I will say that this book is a break between the original students' guide and the general work on surgery, enlarged for the benefit of all. Still, I believe it is a book essentially for students. For them it covers all the operations, the various methods of performing same, and on those accounts gives them a broader way to become operators. It is a new issue that I believe might be followed. To restrict those guides is an error. Why limit the teaching of the student to merely one method for a few operations only, while there

are others which, like the various sutures, the operations on the ear, on the eye, lithotrity, general operations on the foot, etc., are overlooked.

Of course the "*Précis*" is illustrated—195 plates in a book of 300 pages ; some are new, others taken from previous works of the author.

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Now, to resume :

We are in the presence of three good works, each having a respective value ; but the one which interests us the most is that of Williams, one of our boys—an American. It is one of considerable usefulness. As I have tried to show, it contains elements which will prove essentially advantageous to those who will follow his descriptions, and we are sure it will have a warm reception at the hands of the profession. We only fear that this reception will be such and the sale so rapid that Williams will not have the time, as he should have, to prepare and complete his third edition, revised and so much enlarged by the addition of more operations that it will no longer be a simple guide for students, but one for all—a work on general surgery. I will, in the meanwhile, ask him one thing—suggest one point, as I would also to the other two writers, for their next issues. All three seem to know but one manner of performing caudal amputation, viz., with the docking-shears of our grandfathers, or the chisel, mallet and block of wood of still older days. Is there no better, more scientific, more surgical, and less brutal way? I think there is. If so, let them give it also in their next publication, even if they object to it, and let the students judge.

A. L.

A RIGHTEOUS CONVICTION.

There is probably no more injury done to the horse industry in the large cities than that which is inflicted upon owners by dishonest coachmen and, we regret to say, by some who masquerade under the respectable title of veterinarian. Happily, there are but few of the latter, but they accomplish so much in

degrading our honorable profession that their strength numerically is magnified through the enormity of their offence. An owner, trusting confidently in his supposed security from imposition when purchasing horses from dealers, by relying upon the judgment of his trusted Jehu, augmented by the professional opinion of his well-paid veterinarian, sometimes discovers when too late that he has been made the victim of a conspiracy, and that he has been mulcted to the extent of several hundreds of dollars, which have been divided equally between the conspirators. The effect upon this man is to destroy his confidence in the particular coachman whom he employed, but in the case of the veterinarian he goes further and denounces them as a class. If over sensitive, he may sell all his horses and carriages and give up a luxury which appears in his magnified imagination to be beset by dishonesty. Thus there is a loss sustained to every branch dependent upon the horse industry.

When an individual of the former class is brought to justice every honest veterinarian should rejoice, and feel that one viper has been dealt a blow that was richly deserved, and if some of those who disgrace our profession by similar practices could only receive like treatment it would indeed be the best disinfectant that could be applied to our ranks in the large cities.

A case which has brought forth these remarks has just occurred in New York. A gentleman dispatched his coachman to a neighboring city to purchase five horses for his private use. He returned with his purchases, which he reported as costing \$5000, but their quality was so mediocre that an inquiry was instituted, which resulted in the discovery that the horses had been bought for less than half that sum, the dealers acknowledging having raised the receipts at the request of the coachman, whereupon the victim, Mr. E. Clarence Jones, of No. 1 Nassau Street, caused the arrest and conviction of his former coachman, one Anderson, and the court's sentence places the coachman behind iron bars for a period of five years. We cannot recall a similar case, but certainly a wide publicity to this verdict will have a salutary effect upon the gentry who levy

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tribute upon all who deal with horse-owners and pass in through the stable-door. A few more such convictions (and may they include the veterinary leeches who resort to similar practices) and there will be less occasion for them.

THE INTERCOMMUNICABILITY OF TUBERCULOSIS.

THE REVIEW will begin the publication, in the January, (1904) number, of a paper entitled "Robert Koch and His Critics: A Study in the Controversy over the Intercommunicability of Tuberculosis," by D. Arthur Hughes, Ph.D., D. V. M., which very exhaustively reviews the whole subject from the time of Koch's original conclusions in 1882 down to the present year, including the deductions of the leading pathologists of Europe and America. Those who have been unable to follow this great question in all its aspects will find in this comprehensive article the facts and data necessary to place them in possession of all the steps leading up to the present unsettled state of science in regard to it. If the splendid paper read by Dr. Salmon at Ottawa, and published in the October REVIEW, is taken in conjunction with that of Dr. Hughes, the student will have before him all the salient points by which a conclusion can be reached.

CANADIAN WIT AND ENGLISH COMPREHENSION.—A big, good-natured farmer was awaiting the suburban train, accompanied by a handsome Gordon setter. Two sons of Britain stood near him. The dog strayed away from his owner, who was reading a newspaper. "Hey!" called the farmer. "Come here, Locksmith!" and the dog immediately ran to his feet. One of the Englishmen approached the farmer. "May I ask," he said "what you called that dog?" "Locksmith," said the farmer. "And why, pray?" "Because every time I kick him, he makes a bolt for the door." There was a general laugh, in which the Englishman joined. When he returned to his companion he remarked: "Most extraordinary name that man over there calls his dog." "What?" asked his friend. "Locksmith," replied the first Briton. "And why such a name?" "Because, he says, every time he kicks 'im, he runs out of the house!"—(*Farmers' Advocate.*)

ORIGINAL ARTICLES.

NOTES ON THE CLINICAL EXAMINATION OF THE BLOOD OF THE DOMESTICATED ANIMALS.*

BY SAMUEL HOWARD BURNETT, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY, ITHACA, N. Y.

Several years have passed since the methods and technique of making a blood examination have been simple and yet exact enough to be used clinically. The value of this subject has been generally recognized in human practice for some years now. A blood examination gives valuable aid for diagnosis in such a variety of pathological conditions that, as an author has said, "It is difficult to single out any disease in which it may not be of some utility, either as positive or as negative evidence." In the better hospitals the examination of each patient's blood is made as a matter of routine when he is admitted. Briefly stated, the clinical information afforded by a blood examination may be divided into three groups:—(1) where it gives full data for making a diagnosis, as in malaria; (2) where taken with other symptoms it is a valuable or it may be an essential aid in determining the nature of the disease, as in deep seated suppurations; (3) where it affords negative evidence. Simply finding that the blood is normal may be of the very greatest help.

The above refers to human medicine and surgery. Little use has been made in veterinary practice of blood examinations and those mainly in cases of diseases caused by hæmatozoa, as Texas fever and surra. It seems, however, that the clinical examination of the blood would be of even greater importance for animals than it is for man, for the practitioner of human medicine is able to make use of subjective as well as objective symptoms.

* A Paper presented at the Annual Meeting of the New York State Veterinary Medical Society, at Ithaca, Sept. 16, 1903.

With the view of aiding in making comparative clinical hæmatology of greater value, the following data concerning the blood of the more common of the domesticated animals are offered. In the course of my investigations on animal blood it was found difficult to find what had been done by the previous workers in this field. A considerable amount of valuable material is contained in articles whose titles do not indicate that they contain anything concerning normal blood. Owing to this some material may have been missed; but it is hoped that the results of the more important original investigations on the blood of the horse, cow, sheep, goat, dog, cat, pig, rabbit, guinea-pig and chicken are given. For some of these animals the examinations were made on such a small number of cases that the results cannot be regarded as final; but they will be of assistance as giving a hint as to what the normal may be.

The methods of procedure to be followed in counting the corpuscles, getting the percentage of hæmoglobin and making a histological study of the blood are given fully in the standard text-books* on hæmatology. They do not, however, give directions for obtaining blood from animals. The following method has been found to give satisfactory results.

In the smaller animals, blood is obtained most easily from the ear, generally the inner surface of the lobe. In the horse I have found it more convenient to use the side of the neck. In the cow, Smith and Kilbourne procured blood from the rump at the height easiest for the operator. The place from which blood is to be taken should be washed with soap and water,

* The more important of the text-books on hæmatology in English are:

Cabot—"Clinical Examination of the Blood." Third edition. 1898. Wm. Wood & Co., New York.

Coles—"The Diseases of the Blood." 1898. J. & A. Churchill, London.

Da Costa—"Clinical Hæmatology." 1901. P. Blakiston's Son & Co., Philadelphia.

Ehrlich und Lazarus—"Die Anæmie. Nothnagel's Specielle Pathologie." Bd. VIII. 1898. Translated by Myers. "The Histology of the Blood." 1900. Cambridge, University Press.

Ewing—"Clinical Pathology of the Blood." 1901. Lea Bros. & Co., Philadelphia.

V. Limbeck—"The Pathology of the Blood," translated from the second German edition by Latham and Nachbar, New Sydenham Society, Vol. 174, 1901.

Ewing's work is, everything considered, the most valuable of these. It contains full bibliographies of the various parts of the subject.

rinsed with clear water, then with alcohol, and dried. In the investigation referred to above in cattle, the hair was first clipped, then shaven. I have not done this with the horse as this produces a rather noticeable blemish. It was found that it was sufficient to simply part the hair and make the incision in the parting. Where blood is obtained from the lobe of the ear, a blood lancet is the most convenient instrument to use. Ehrlich recommends using a fine steel pen with one nib broken off, the other sharpened. In fact, this answers about as well as a special blood lancet. With the larger animals, horse or cow, a larger incision is necessary. A fleam, preferably a spring fleam with a rather wide blade, has been found most convenient. The incision, which should be well through the skin, may be regulated in this instrument by a set screw. In all cases the incision should be large enough to yield a sufficient amount of blood without pressure near the incision, as pressure near the wound forces lymph from the tissues and dilutes the blood, rendering a count valueless. The wound from the fleam heals quickly. After sufficient blood has been secured, the edges of the wound are held together until they adhere. I have generally disinfected the site in the horse with carbolic acid, 5 per cent. On the following day it required careful search to find the place from which the blood had been taken.

THE BLOOD OF THE HORSE.

The red corpuscles have an average diameter of 5.8μ , the extremes being 3.8μ and 7.8μ . These measurements are for fresh blood. In films fixed by heat, alcohol or osmic acid, the size is smaller than given above. The normal number for a healthy horse is somewhat above 7000000 per cmm. Sussdorf gives the normal number as 6500000 to 8000000 per cmm., the average being 7212500. Hayem gives the normal percentage of hæmoglobin as 58. Examinations that I have made give a higher percentage than this. The average of eleven different animals was 62.5 per cent. Five of these cases had less than 6000000 red corpuscles per cmm. The specific gravity is about 1060 (Sussdorf). The normal number of leucocytes is 9500 ac-

according to Hayem. In my cases where there were more than this number it seemed to be due to a pathological condition, generally an inflammation. Five varieties of leucocytes are found in the circulating blood, namely: lymphocytes, large mononuclear, polynuclear, eosinophile and mast cells. The number of each variety has not been satisfactorily determined for normal horses. Until the number has been made out for normal animals, the following may be of use as giving a hint as to what may be expected to be found in a normal horse. In seven horses the lymphocytes had an average of about 22 per cent.; the large mononuclears 3 to 4 per cent.; the polynuclears about 72 per cent.; the eosinophiles 2 to 3 per cent.; the mast cells 0.5 to 0.6 per cent. The average size of lymphocytes is slightly larger than the red blood corpuscles, the extremes in fixed and stained films being 4.6μ to 11.0μ in diameter. Large mononuclear leucocytes were found from 9μ to 15.2μ , the average being about 11μ . Polynuclear leucocytes have an average diameter of about 12μ , the extremes found being 8.1μ and 16.4μ . Eosinophiles have about the same average diameter as the polynuclears, the extremes measured being 8.6μ and 15.2μ . Mast cells are somewhat larger than eosinophiles, the average of those measured being 1.53μ , the extremes being 11.6μ and 17.6μ .

Lymphocytes in films stained with Ehrlich's triacid stain show a well-stained, coarsely reticular nucleus of a bluish green color. It occupies nearly all of the cell, only a narrow zone of cytoplasm of a purplish tint extending around it. The outline of the nucleus is commonly circular; but may be incurved or with a notch or deep sinus on one side. With eosin and methylene blue the nucleus and cytoplasm are stained blue, the reticulum taking a deep blue color. Generally the nucleus is more deeply stained, but may be less so than the cytoplasm. With Wright's* stain the nucleus has a purplish color with a more deeply stained reticulum. The cytoplasm is a greenish blue.

*Wright — "A Rapid Method for the Differential Staining of Blood-Films and Malarial Parasites," *Journal of Medical Research*, Vol. VII (2), No. I, Jan., 1902, p. 138.

In the large mononuclear leucocytes the nucleus is oval or curved and occupies about one-half or two-thirds of the cell. Ordinarily it is situated at one side of the cell. With Ehrlich's triacid stain the nucleus has a pale bluish green and the cytoplasm a purplish tint. Both nucleus and cytoplasm are more finely reticular than in the lymphocytes. With eosin and methylene blue the nucleus is blue, but not so deep as in lymphocytes. It may have one or more deeply stained areas that resemble nucleoli. The cytoplasm is of a pale blue color. With Wright's stain the nucleus is purplish with deeper stained reticulum. The cytoplasm is of a greenish blue color. Both nucleus and cytoplasm are less deeply stained than in lymphocytes.

Polynuclear leucocytes with Ehrlich's triacid stain have a pale bluish green nucleus. The form of the nucleus varies greatly, those more often seen being spirally coiled, twisted, S-shape, U-shape or elongated. The cytoplasm is of a pale pinkish tint and contains many fine, deeply stained, purplish granules. With eosin and methylene blue the nucleus is sharply stained with methylene blue and is coarsely reticular. The cytoplasm is faintly stained with eosin. Granules are not stained except when the preparations are overstained with eosin, when they may have a bright pinkish tint. With Wright's stain the coarsely reticular nucleus is sharply stained, a purplish color, while the cytoplasm has a pinkish tinge. The granules have a bright reddish violet color.

Eosinophiles are the most conspicuous of the leucocytes whether stained or in fresh blood. When unstained the granules are refractive and have a greenish white tint. The granules are very large, much larger than the corresponding granules in other animals. They vary in size considerably, but are ordinarily 1μ to 1.5μ in long diameter. Their outline is round, oval, ovate or oblong. In the living cell undergoing amœboid movement the shape of the granules may be seen to change. The number of granules in a cell is usually from 10 to 40. Stained with Ehrlich's triacid stain the nucleus has a pale greenish color.

It is generally bi-lobed. The granules are copper colored. With eosin and methylene blue the nucleus is blue, coarsely reticular, resembling the nucleus of polynuclear leucocytes, though not so deeply stained. The granules are stained by the eosin. With Wright's stain the nucleus is purplish, resembling in general that of a polynuclear leucocyte. The granules have a rosy red tint.

Mast cells with Ehrlich's triacid stain are not readily distinguished, as the granules are not stained. The nucleus is generally bi-lobed with a thick connecting part; but is sometimes horse-shoe shaped.

With eosin and methylene blue the nucleus is pale blue, often showing a deeper stained reticulum. The granules are of different sizes, from minute dots to round, oval or circular granules somewhat smaller than the average eosinophile granule. They have a deep blue color. With Wright's stain the nucleus is pale blue, the cytoplasm a faint pink, while the granules are stained a deep purplish color.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE HORSE BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
7403500	9500	58	.....	5.5 μ	Gulliver.
6300000	.....	.....	.....	5.58 μ	Hayem.
7212500	.....	.....	1060	5.5 μ	Malassez.
7215000	.....	.....	.....	5.8 μ	Sussdorf.
8450000	.....	.....	.....	.....	Trasbot.
					Wendelstadt und Bleibtreu.

THE BLOOD OF THE COW.

The work on the blood of the cow has been done mainly by Smith and Kilbourne in their investigations on Texas fever. They found the normal size of red corpuscles to be about 5 μ or 6 μ . Bethe gives the size of ox blood as from 4.6 μ to 7.2 μ . Malassez gives the average diameter as 6 μ . Sussdorf gives the average size as 5.6 μ . Smith and Kilbourne give the average number of red corpuscles as about 6000000 per cmm. They

found that 7000000 in winter and 5000000 in late autumn seem not to be uncommon. The average number of leucocytes obtained by Smith and Kilbourne is 9730 per cmm. In the 47 animals examined they found from 5138 to 15000 leucocytes per cmm. Their counts were based on a small number of leucocytes for each case. The authors state that the figures given are only approximately accurate. I give them, however, as they give a hint as to what one may expect to find in the normal blood. Hayem gives 12000 per cmm. as the number of leucocytes for *Bos Indicus*.

The varieties of leucocytes as described by Hirschfeld are:—mononuclears, similar to those of the horse; polynuclears containing fine neutrophile granules; eosinophiles similar to those of man; and mast cells. The number of each variety has not been determined.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE COW
BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author
6275000	.....	.....	.....	4.6-7.2 μ	Bethe.
.....	.....	.....	.....	5.95 μ	Gulliver.
8712500*	12000	57	.....	.....	Hayem.
4200000	.....	.....	.....	6 μ	Malassez.
6000000	9730	.....	.....	5-6 μ	Smith & Kilbourne.
5073000	.....	.....	.....	.....	Stöltzing.

THE BLOOD OF THE SHEEP.

The red corpuscles of sheep's blood are smaller than those of the cow. Welcker gives the average diameter as 5 μ . Bethe gives the diameter as 3.9 μ to 9.5 μ . The number per cubic millimetre is 9133000 according to Bethe and 12090000 according to Cohnstein. Müntz gives the specific gravity of the blood of sheep as 1038. Bethe gives the leucocytes as 4140 per cmm. as normal for sheep. The varieties of leucocytes according to Hirschfeld are:—(1) eosinophiles resembling those of man, (2) neutrophiles with very fine and numerous granules, (3) mast cells and (4) lymphocytes. The numbers of the different varieties have not been determined.

* Examination of the blood of *Bos Indicus*.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE SHEEP
BY DIFFERENT INVESTIGATORS.

Red Cor- puscles per cmm	Leucocytes per cmm.	Hæmo- globin per cent.	Specific gravity.	Size of red corpuscles.	Author.
9133000	4140	.....	.....	3.9-5.9	Bethe.
12090000	4.9	Cohnstein.
.....	4.79	Gulliver.
.....	1038	.....	Müntz.
.....	5 μ	Welcker.

THE BLOOD OF THE GOAT.

The red corpuscles of the goat have an average diameter of 4.1 μ (Welcker), 4.25 μ (Hayem). The number per cmm. is given as 9-10000000 (Sussdorf), 19000000 (Hayem), 18000000 (Malassez). Hayem gives the hæmoglobin as 21 per cent. The specific gravity is given by Sussdorf as about 1042. The leucocytes are given by Hayem as 30000 per cmm. Hirschfeld describes the following varieties of leucocytes in the goat:—large and small lymphocytes, polynuclears containing neutrophile granules, similar to those of the sheep, eosinophiles resembling those of man and of sheep, and mast cells.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE GOAT
BY DIFFERENT INVESTIGATORS.

Red Cor- puscles per cmm.	Leucocytes per cmm.	Hæmo- globin per cent.	Specific gravity.	Size of red corpuscles.	Author.
.....	3.9 μ	Gulliver.
19000000	30000	21	.....	4.25 μ	Hayem.
18000000	3.5 μ	Malassez.
9-10000000	1042	4.1 μ	Sussdorf.
.....	4.1 μ	Welcker.

THE BLOOD OF THE DOG.

The red corpuscles of dog's blood are given as having an average diameter of 7.3 μ . The number of red corpuscles is from 4000000 to 8000000 per cmm., average 6206000 (Busch and Van Bergen). There is considerable difference in the per-

centage of hæmoglobin obtained by different investigators. Sherrington found an average of 58, while Rieder obtained an average of 117. The specific gravity is about 1060 (Sussdorf). There are about 10000 leucocytes per cmm. Busch and Van Bergen obtained an average of 9526 per cmm. Of these they found an average of lymphocytes 21 per cent., large mononuclears 6.8 per cent., polynuclears 65.7 per cent., eosinophiles 5.3 per cent. and mast cells rare. The same authors state that "there are five distinct types of leucocytes in circulating dog's blood. These are: a small mononuclear form, a large mononuclear form, a polymorphonuclear form, usually non-granular but occasionally with fine neutrophile granules, and eosinophiles with coarse, round or oval granules and a mast cell with fine, metachromatic granules." Dawson says that in normal blood there are 22 to 560 nucleated red corpuscles per cmm.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE DOG
BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles	Author.
6206000	9526	. . . .	. . . .	. . . .	Busch & Van Bergen
7215000	19300	87	. . . .	. . . .	Dawson.
.	15800	. . . .	. . . .	. . . .	Goodall, Gulland & Paton.
. . . . .	. . . .	. . . .	. . . .	7.17 μ	Gulliver.
6650000	10000	71	. . . .	7.2 μ	Hayem.
7358000	21058	. . . .	. . . .	. . . .	Hünefauth.
7418000	11757	. . . .	. . . .	. . . .	Lyon.
. . . . .	. . . .	. . . .	. . . .	6.95 μ	Manassein.
6123700*	. . . .	. . . .	. . . .	. . . .	Otto.
5799500†	. . . .	. . . .	. . . .	. . . .	"
7332000	8686	117	1063	. . . .	Rieder.
5578000	9438	58	1058.8	. . . .	Sherrington.
4092000 to	. . . .	. . . .	. . . .	. . . .	Stöltzing.
5644000	. . . .	. . . .	. . . .	. . . .	"
. . . . .	. . . .	. . . .	1060	7.3 μ	Sussdorf.
.	12400	. . . .	. . . .	. . . .	Tallqvist und v. Willebrand.
4420000	. . . .	. . . .	. . . .	7.3 μ	Vierordt.
. . . . .	. . . .	. . . .	. . . .	7.3 μ	Welcker.
6426500	. . . .	. . . .	. . . .	. . . .	Worm-Müller.

*Male. †Female.

The diameter of the red corpuscles of cat's blood is given as 6.5μ by Welcker and 6.2μ by Hayem. There is considerable difference in the number of red corpuscles given by different investigators. Hayem gives 9900000 per cmm. as the average while Sherrington finds 6857000 the average in the animals examined by him. The hæmoglobin is about 45 per cent.; the specific gravity about 1054. There is as much variation in the number of leucocytes reported as in the red corpuscles. Hayem found 7200 while Sherrington obtained an average of 14017 per cmm. Sherrington found nucleated red corpuscles in adult cats; but less commonly than in dogs.

Hirschfeld describes the following varieties of leucocytes in the cat:—(1) two varieties of coarsely granular, aurantiophile cells. (2) non-granular, neutrophile cells. (3) mast cells and (4) lymphocytes. Sherrington classifies them as hyaline, coarsely granular and finely granular and obtained the following numbers and percentages of each variety: hyaline 2751 (19.6 per cent.), coarsely granular 1173 (8.3 per cent.), finely granular 10093 (72 per cent.). In a single cat examined, Goodall, Gulland and Paton found 13500 leucocytes per cmm. A differential count of these showed the following varieties:—mononuclear 5467.5 (40.5 per cent.), polymorphonuclear 6750 (50 per cent.), and eosinophiles 1282.5 (9.5 per cent.).

TABLE GIVING THE NUMBER OF LEUCOCYTES AND PERCENTAGE OF VARIETIES.

Leuco-cytes.	Lympho-cytes.	Large Mononuclear.	Poly-nuclear.	Eosins.	Mast. cells.	Author.
9526	21%	6.8%	65.7%	5.3%	rare.	Busch & Van Bergen Dawson.
19300	22.17%	4.42%	64.56%	8.55%	...	
15800	18.5%	6.5%	60.5%	14.5%	...	Goodall, Gulland & Paton. Sherrington.
9438	17%		75.%	7.8%	...	
12400	5-10%	10-15%	70-80%	4.8%	-0.5%	Tallqvist und v. Willebrand.

THE BLOOD OF THE CAT.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE CAT BY
DIFFERENT INVESTIGATORS.

Red Cor- puscles per cmm.	Leucocytes per cmm.	Hæmo- globin per cent.	Specific gravity.	Size of red corpuscles.	Author.
. . . .	13500	. . . .	. . . .	. . . . .	Goodall, Gulland & Paton.
. . . .	. . . .	. . . .	. . . .	5.76 μ	Gulliver.
9900000	7200	45	. . . .	6.2 μ	Hayem.
. . . .	. . . .	. . . .	. . . .	5.77 μ	Manassein.
6857000	14017	45.5	1052.6	. . . . .	Sherrington.
. . . .	. . . .	. . . .	1054	6.5 μ	Sussdorf.
. . . .	. . . .	. . . .	. . . .	6.5 μ	Welcker.

THE BLOOD OF THE PIG.

The red corpuscles of the blood of the pig have an average diameter of 6 μ , the size varying from 5.28 μ to 7.9 μ (Bethe). The number of red corpuscles are given as 5440000 (Stöltzing) and 6960000 (Bethe) per cmm. The specific gravity is given by Sussdorf as about 1060. The leucocytes are given by Bethe as 7840 per cmm. Drake gives the varieties of leucocytes for 15 normal animals as: lymphocytes 33-77 per cent., average 56.4 per cent.; polynuclears 18-66 per cent., average 38.46 per cent.; eosinophiles 1-12 per cent., average 5.13 per cent.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE PIG
BY DIFFERENT INVESTIGATORS.

Red Cor- puscles per cmm.	Leucocytes per cmm.	Hæmo- globin per cent.	Specific gravity.	Size of red corpuscles.	Author.
6960000	7840	. . . .	. . . .	5.28-7.9 μ	Bethe.
.	6 μ	Gulliver.
5441000	Stöltzing.
.	1060	6 μ	Sussdorf.
8668200	Wendelstadt und Bleibtreu.

THE BLOOD OF THE RABBIT.

The red corpuscles of rabbit's blood are only slightly smaller than the average size of those of man. The average given by

several investigators is about 7.1μ . There is considerable variation in the normal number of red corpuscles as obtained by different workers. Cohnstein and Zuntz found 4845000 per cmm. while Löwit obtained 7107000 per cmm. Hayem gives the percentage of hæmoglobin as 69. The specific gravity is given by Sussdorf as 1049 and by Müntz as 1046.2. The average number of leucocytes is about 10000 per cmm. The varieties of leucocytes are described by several investigators. Brinckerhoff and Tyzzer describe them as follows:

I. Lymphocytes. Nucleus circular, chromatin generally

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE RABBIT
BY DIFFERENT INVESTIGATORS.

Red Cor- puscles per cmm.	Leucocytes per cmm.	Hæmo- globin per cent.	Specific gravity.	Size of red corpuscles.	Author.
5164000	7800	...	...	5.3-7.9 μ	Bethe.
4845000	...	...	...	...	Cohnstein und Zuntz
...	...	...	...	7.04 μ	Gulliver.
6410000	6200	69	...	7.16 μ	Hayem.
5965000	11800	...	...	...	Hünefauth.
...	75-8500	...	...	...	Kinghorn.
7107700	10720	...	...	...	Löwit.
...	...	...	...	6.3 μ	Manassein.
...	7537	...	...	...	Muir.
...	...	...	1046.2	...	Müntz.
5637500	8752	96.5	1059	...	Rieder.
4866000	...	...	...	...	Stöltzing.
...	...	...	1049	...	Sussdorf.
...	11000	...	...	...	Tallqvist und
...	...	...	...	...	Willebrand.
6031000	...	...	...	6.9 μ	Vierordt.

TABLE GIVING NUMBER OF LEUCOCYTES AND PERCENTAGE OF
VARIETIES.

Leuco- cytes.	Lympho- cytes.	Large Mononuclear	Poly- nuclear.	Eosins.	Mast cell.	Author.
...	45-55%	2-8%	40-50%	0.5-1%	4-8%	Brinckerhoff and Tyzzer.
10720	5119=47.7%	...	5601=52.2%	...	...	Löwit.
7537	3034	904	3599	...	...	Muir.
11000	20-25%	20-25%	45-55%	0.5-3%	2-5%	Tallqvist und Willebrand.

in masses centrally arranged. Protoplasm non-granular and strongly basophile ($7-9\mu$ in diameter).

II. Large mononuclear. Nucleus oval or curved, vesicular. Protoplasm non-granular, faintly basophile ($12-16\mu$ in diameter).

III. Amphophile. Nucleus polymorphous, chromatin in masses murally arranged. Protoplasm granular; granules small, ovoid, oxyphile, may have selective affinity for acid dyes under certain circumstances ($10-12\mu$ in diameter).

IV. Eosinophile. Nucleus polymorphous, chromatin in masses murally arranged. Protoplasm granular; granules large, ovoid, oxyphile ($12-14\mu$ in diameter).

V. Mast cell. Nucleus polymorphous, poor in chromatin. Protoplasm granular; granules small, spherical, basophile, metachromatic ($10-12\mu$ in diameter).

THE BLOOD OF THE GUINEA-PIG.

The size of the red corpuscles of guinea-pig's blood is slightly larger than those of the rabbit. Hayem gives the diameter as 7.48μ and Gulliver gives it as 7.17μ . The number of red corpuscles per cmm. is about 5000000. The average percentage of hæmoglobin according to Hayem is 93. I found it to average 96 per cent. in six animals examined. The average number of leucocytes is given from 5600 (Hayem) to 12600 (Kurloff). In seven healthy animals I obtained counts of 5555 to 21897 per

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE GUINEA-PIG BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Specific gravity.	Size of red corpuscles.	Author.
5144000	7240	...	...	$6.6-9.24\mu$	Bethe.
4240000	...	...	...	...	Cohnstein und Zuntz
...	...	...	...	7.17μ	Gulliver.
5859500	5600	93	...	7.48μ	Hayem.
5780000	12600	...	...	...	Kurloff.
3600000	...	...	...	...	Malassez.
...	9400	...	...	...	Rieder.
5308000	12707	96	...	...	Personal observat'n.

cmm., the average being 12700 per cmm. Kurloff and Hirschfeld have each described the varieties of leucocytes found in guinea-pig's blood. Kurloff gives the the following varieties : (1) pseudoeosinophile (polynuclear) 40-50 per cent., (2) eosinophile about 1 per cent., (3) nigrosinophile (about 0.5 per cent.), (4) vacuole bearing cells (large mononuclear) 15-20 per cent. and (5) lymphocytes 30-35 per cent.

THE BLOOD OF THE CHICKEN.

The size of the red corpuscles of chicken's blood is given as about 12.1μ by 7.3μ . The number per cmm. is about 3600000. The percentage of hæmoglobin is given by Hayem as 112. The leucocytes are 20000 to 26000 per cmm. The varieties of leucocytes have not been satisfactorily described for the blood of the chicken. From the investigations of Moore, polynuclear leucocytes with spindle-shaped granules are the phagocytes and are the ones that are increased in number in an infectious disease described by him.

TABULATED SUMMARY OF EXAMINATIONS OF THE BLOOD OF THE CHICKEN BY DIFFERENT INVESTIGATORS.

Red Corpuscles per cmm.	Leucocytes per cmm.	Hæmoglobin per cent.	Size of red corpuscles.		Author.
			Length.	Breadth.	
.....	.....	.....	12.08μ	7.32μ	Gulliver.
2400000	26300	112	11.5μ	7.18μ	Hayem.
3100000	.....	.....	13.5μ	6.5μ	Malassez.
.....	.....	.....	12.96μ	7.33μ male	Manassein.
.....	13.09μ	7.15μ female	"
3637000	20081	Moore.
3860000	Stöltzing.
.....	12.1μ	7.2μ	Welcker.

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THE NEW YORK STATE VETERINARY MEDICAL SOCIETY has begun the prosecution of illegal practitioners, its attorney having brought several before the bar within the past few weeks.

THE KANSAS CITY VETERINARY COLLEGE has occupied its new and commodious college building, and a letter from Dean Stewart states that the school is progressing well in all departments.

THE MINNESOTA LIVE STOCK SANITARY BOARD seems to be giving excellent satisfaction and to be getting along nicely. Dr. Ward, the Secretary and Executive Officer, is credited with being a hard worker, giving prompt and thorough service and excellent satisfaction to the stock interests. Minnesota's veterinary sanitary work is now under veterinary executive control instead of being under a board of physicians with an M. D. executive.

A NEW REMEDY FOR TETANUS.—*Zanesville, O., Nov. 21.*—What is believed to be a very important discovery was made in an accidental way by Dr. J. A. Lee, a veterinary surgeon of this city, yesterday, while trying to kill a horse with lockjaw. Last Tuesday William Wells took a valuable horse to Dr. Lee's stables for treatment. The first day Dr. Lee injected eight tubes or eight cubic centimetres of anti-toxin into the animal. On Wednesday the same dose was repeated, and Thursday six tubes were administered and the horse began to improve. The next day Mr. Wells and Dr. Lee agreed that the horse could not recover and decided to kill the animal. Dr. Lee accordingly injected a dram of prussic acid into the horse's jugular vein. No change was noticed, notwithstanding the deadly character of the poison, and after waiting a while a dram and a half of the acid was injected into the horse's trachea. This was enough to kill twenty horses, but instead of dying the horse is recovering. The muscles of the jaw have relaxed and Dr. Lee believes that a permanent cure has been effected.—(*New York Herald, Nov. 22.*)

A QUESTION RELATING TO THE SERUM-THERAPY OF THE "APHTHA EPIZOOTICA."—ITS ACTUAL STATE.

BY PROF. EDOARDO PERRONCITO, TURIN, ITALY.

A communication made to the Royal Academy of Agriculture of Turin, at its Assemblage, May 29th, 1903, and Presented to the American Veterinary Medical Association, at its 40th Annual Meeting, at Ottawa, Can., Sept. 1-4, 1903.

TRANSLATION BY ALADINO A. ANTILIO, PHILADELPHIA, PA.

The serum and hemo-therapy* which, two years ago, under our direction, worked miracles in the Novara province, in the fight against the epizootic aphtha, seemed, for a while, buried under the criticism of partisans and cunningly interested persons. But, as it always happens with things which are good and well founded, it has now arisen under better auspices.

Doubtless, it is to Löffler and Ecker that the merit belongs of having tried first of all the serum-therapy in order to prevent and fight the aphtha epizootica on animals, especially cattle, sheep and pigs. Löffler, especially, being generously aided by the German government, has confronted the grave question for several years, and after having demonstrated certain very important properties of the "aphthous-virus" experimented extensively on the serum-therapy of the aphtha. But the immunity thus obtained from serum, being weak and of short duration, he thought for a moment to reinforce it with "serum-aphthine," *i.e.*, with serum of animals subjected to immunity, to which he added virulent lymph, directly extracted from the vesicles of the aphtha. Yet, notwithstanding this modification, the results were not encouraging; on the contrary, the practical effects, in some places, were little less than disastrous, so that the eminent experimentator returned to the study of simple serum-therapy.

* E. Perroncito: on the hemo-therapy and hemo-prophylaxis of the aphtha epizootica, etc.

R. Acc. di Med. di Torino, adunanza del 3 maggio 1901; R. Soc. Naz. di Veterinaria, seduta del 1° giugno 1901; R. Acc. di Agric., seduta die 14 luglio 1901.

Nocard and Leclainche* epitomized these labors of Löffler in the following sentences that we are happy to reproduce: "The serum of the immunized animals possesses very weak properties, and the passive immunity conferred is of short duration."

The most active serum immunizes cattle only with the dose of $\frac{4}{10}$ of c.c. per kg. of living weight, requiring 240 c.c. for a 600 kg. cow. The refractory condition persists, on an average for 14 days only. The insufficiency of the method is evident, and it has been necessary to seek for a process of immunization both active and durable. The check of the serum-aphthine, however, has determined a return toward serum-therapy which has, at least, the advantage of being harmless. Löffler and Uhlenhuth† recognize that the prevention by serum is impractical with cattle, but they think it may be useful with sheep and pigs. They inoculate under the skin from 5 to 20 c.c. following the ages and weights of the subjects; it is recommended to raise the dose with little pigs, as they are very sensitive to the aphthous virus. The advantages of preventive serum-therapy, with small animals, are too feeble to compensate for the high expenditure of intervention. The period of immunization is too short to make sure that a single intervention may surely preserve the subjects exposed, and the repetition of the treatment is too costly to be recommended.‡

But in the issue of May 1st, 1903, of the "Recueil de Médecine Vétérinaire" in regard to the anti-aphthous serum is read: "On march 12th last, E. Nocard delivered a lecture, under the chairmanship of Foex and Magnien, General Commissioners of the Exhibition, in the buildings of the General Agricultural Exhibition, in order to demonstrate the advantages and the efficacy of the anti-aphthous serum."

* E. Nocard and E. Leclainche: *Les maladies microbiennes des animaux*. t. I, pag. 580, 3d edition.

† Löffler u. Uhlenhuth: *Ueber die schutzimpfung gegen die M. und K. Bakter*. Heft xxix, p. 19, 1901.

‡ E. Nocard and E. Leclainche: Work and page quoted.

Every year, at the time of the exhibition, the animals were carefully examined as to their health. Notwithstanding this, however, during the show, the infection always appeared on a certain number of animals, and this clearly came from the fact that some owners, farmers, cow-boys or cattle traders who pass as "connoisseurs" imported the malady in germs from the locality whence they came.

It is against this danger that we must interfere.

For two consecutive years Nocard and Roux, aided by Valles and Carri, diligently continued their researches on the epizoötic aphtha, in the institute erected for this purpose at the Alfort school. But they have not yet succeeded in discovering nor cultivating the microbe which would have allowed them, doubtless, to obtain an efficient vaccine or serum.

Furthermore, they have recognized, as Löffler had done, that the serum of heated animals possesses a certain activity for immunization, but it is necessary to inject too large a quantity of serum (up to c.c. 1000). But the fact remains that such injections strengthen immunity, and the A. A. have succeeded in obtaining a serum which at the dose of 20 c.c. preserves cattle against the effects of an inoculation much larger than that which normally infects the animals. These results of the laboratory, confirmed by practice, give evidence of their importance and constitute the best criterion of their value.

Unfortunately, however, the anti-aphthous serum-therapy which has immediate immunizing action, lasts only a fortnight. Furthermore, it is impossible to utilize this method in cases of epizoösis, for the dose of 20 c.c. ought to be injected in every beast every 15 days, necessitating an enormous quantity of serum.

But as far as exhibitions are concerned, the services rendered by such inoculations are more than sufficient and practical, for, in this way, the owners and the traders avoid the danger of receiving back their cattle, infected by epizoötic aphtha.

As I have already said, Löffler, in one of his reports dated 1901,* has signaled a new process to obtain, in the cattle, an

* Löffler: *Berl. Thierärztliche Woch.*, March 28th, '03.

immunity of a certain duration against the epizoötic aphtha.

This method consists in the intravenous inoculation of old lymph, become inactive by having been preserved in a refrigerator. This lymph was mixed in the dose of $\frac{2}{10}$ of c.c. with $\frac{1}{10}$, $\frac{2}{10}$ up to $\frac{3}{10}$ c.c. of new lymph, exposed for 5' to the temperature of 60° C. in order to kill the germs.

The animals thus vaccinated, being placed in an infected stable, remained, in the greater part, untouched from a week and a half to three weeks. Those which contracted aphtha, after 10 to 14 days, presented an eruption of benign nature in the mouth and on the tongue. The results would therefore be apparently satisfactory; however, the experiments made had shown: (1) That immunity manifested itself only after a given period. (2) That the lymph reached too high a price in proportion to the immunity produced, which was not sufficient to prevent the development of apthous epizooosis in a determined region.

These considerations had induced Löffler to abandon for a moment the trodden way, and direct his researches to the discovery of a serum which could prevent infection.

Each of four calves was inoculated directly into the vein with $\frac{1}{10}$ of c.c. of fresh and very virulent lymph. As soon as the temperature had reached 40° C. (in less than 22 to 30 hrs.) there were inoculated in the same way 20, 50, 100, 200 c.c. of serum taken from a cow already treated by progressive doses of lymph. The first two, which had respectively 20 and 50 c.c. of serum, contracted a benign form of epizoötic aphtha, while the other two which had 100 and 200 c.c. of serum remained completely untouched. Encouraged by this experiment they produced the intensified immunization of cattle which were to serve for the preparation of serum, by progressive doses of lymph. To this end they used lymph obtained from cultures upon young pigs, which are very well adapted for such work.

The serum taken from cattle was tried with success on other cattle. The dose established was 75 to 100 c.c.

Now, with this dose, he obtained, in most of the animals,

such an immunization that they remained untouched for more than a month, in infected stables.

Some had the disease still, but in a mild form.

From 200 c.c. the dose was lowered to 60 c.c., then to 50 and 20 c.c., but these two last doses have not been proved surely preventive, and nearly half the animals inoculated, contracted the disease. Yet, encouraged by these results, Löffler started to study practically the immunizing effects of this serum. A series of aphthous epizootis allowed him a good chance, and in his report of 1901 he was able to formulate this conclusion. Now, it is almost safe to affirm that the new bovine serum furnished a practical medium by which we may henceforth fight and overcome this pest. However, it is necessary still to continue the studies with the serum in question, and to try, above all, its efficacy on the malignant forms of epizootic aphtha, which cause so many losses to the breeder of South Germany.

Evidently Löffler had not yet known of our labors, otherwise he would have seen that even in the cases of aggravated and malignant aphtha, the question of serum-therapy or hemo-therapy was solved. It will be sufficient to read the new work already quoted, "on the hemo-therapy and hemo-prophylaxis of epizootic aphtha" in order to be thoroughly persuaded. Our studies which resulted so fortunately in 1901 were performed essentially on an epizootic aphtha. In 1902 Löffler, starting from the observed facts, sought to determine the degree of immunity conferred to cattle by the established dose of 100 c.c. of serum, *i. e.*, the quantity of virulent lymph the cattle would be able to stand when subjected to intravenous injection of 100 c.c. of serum.

This dose was supposed, practically, to confer immunity to nearly all bovines, against epizootic aphtha.

To this end he chose a series of cattle of nearly the same weight and development; to each of these he injected 100 c.c. of serum, and after 24 hours he subjected them to a gradual injection of virulent lymph, so that to some he inoculated $\frac{1}{100}$, to others $\frac{1}{50}$ or $\frac{1}{20}$, $\frac{1}{10}$, $\frac{2}{10}$ and $\frac{3}{10}$ c.c. Thus Löffler established that

the best serum neutralized the virulence of $\frac{2}{10}$ c.c. of lymph. This is indeed an enormous dose of virus, when we think that, generally, $\frac{1}{20000}$ and even $\frac{1}{40000}$ of virulent lymph is enough to infect a cow in health, even acting on a desquamated epidermic surface, with subjects slightly contaminated. And if the vaccinated animal is placed near a sick one, with large aphthæ in its mouth, especially on its tongue, calculating that the quantity of virulent lymph produced and spread by the saliva of this last may be elevated to several c.c. it is useless to remember that, in these circumstances, the 100 c.c. of serum will not confer to the vaccinated animal such an immunity as to be able to resist the infection which endangers it. From this come the ill successes registered in the course of vaccinations performed in 1901. On the contrary, these very same experiments have shown that repeated doses of serum, less than 100 c.c. and reduced even to 20 c.c., confer immunity to the animals in a stable doubtlessly infected, on the condition that it be sought to prevent the direct infection of the vaccinated cattle, through water, feed or virulent saliva, and that the vaccination be performed before the infection happens through the saliva.

Experiments still under way have the object of possibly verifying if doses from 5 to 10 c.c. of serum be sufficient to immunize cattle against the natural infection due to a weak quantity of lymph. The researches of Löffler have evidently a great practical importance. In the fight against aphtha he recommends the compulsory vaccination of all cattle admitted to the markets, and for all those coming from foreign parts or from an infected centre. From Löffler's exposition it is clear that the creation of a special institute for the preparation of a serum which may be sold at low prices would be the needed corollary of this sanitary innovation, which he thinks simple and of easy realization.

And I fully agree with this conclusion, for without a centre of production of serum, or hemo-aphthine, both owners and veterinarians would remain in the same actual position, in which they do not know where to turn, not only to prevent, but even to

rationally treat their cattle against aphtha. The cases of malignant aphtha, happily cured with hemo-aphthine, were very numerous in the Novara province, being initiated by myself and continued under the direction of Drs. Bono and Tubasso, as reported in their special publications.

The hemo-aphthine is prepared with the blood of cattle repeatedly inoculated or aphtho-ized with lymph or materials of infected animals, or, better, with blood of cattle which have overcome aggravated or malignant aphtha and which possibly have been reinoculated several times with apthous virus (lymph gathered from vesicles of the aphtha, diluted or undiluted with physiologic salt solution passed through a Chamberland or Berkefeld candle) in order to obtain saturation of the organism, as is done in the preparation of the serum against charbon or hemo-anthroxine, which for some time has been prepared and experimented with successfully in cattle, in cases of mortality, before or after the charbonous vaccination, when this is practiced while the charbonous epizösis is already manifested.

The blood of animals immunized against aphtha is defibrinated gradually, while it is being aseptically collected by means of an incision or by collecting the blood of the animal which is slaughtered, and filtered through aseptic absorbent cotton, while from 3 to 4 per cent. of sulphuric ether and 0.75 per cent. of formalin (as it comes from the pharmacies) are added to it. Thus, the liquid immunizing preparation, called by me hemo-aphthine, may be kept for a long time, and is used in subcutaneous injections in the proportion of 1 or $\frac{1}{2}$ c.c. (or even less) of every kg. of net weight of the animal. That is to say, at the dose of 20, 50, 100, 200, 300 gm. per head according to the weight of the animal to be inoculated, and the degree of preparation of the animal which has served for the production of the hemo-aphthine. And, now, a few practical illustrations, which I take from my preceding special work, published in 1901, and already referred to in the margin.

On April 3d, 1901, Senator Faroggiana had invited me to

visit his farm of Castellazzo, where there were 80 cows, 2 bulls, and some calves, attacked by grave aphtha seven days before, *i. e.*, on March 27th.

On April 1st a cow had died, on the 2d another, on the 4th four others, and during the nights of the 4th and 5th two more had died. I proposed without delay to inoculate the new preparation, hemo-aphthine, and on the evening of the 5th with Dr. Del Bono, sanitary officer of Novara, and with the veterinary doctors Bertone and Binotti, and with the sanitary guard, we went together to Castellazzo, to the farm.

There we chose 28 cows, more gravely stricken, and we subjected them all to the inoculation of the new preparation, hemo-aphthine, to be compared with the others which had a more benign aphtha and were diligently treated by the ordinary methods. The injections began at 20.35 o'clock (*i. e.*, 8.35 P. M.) of the 5th and ended about 2 A. M. of the 6th. The results thus obtained seemed a revelation, for the cows which had not eaten for eight days immediately began to eat, some of them only 30 minutes after the inoculation, and the improvement was relatively so rapid that it aroused great enthusiasm among the farmers, who had been frightened by the terrible pest.

Since then, we continued the inoculations with other material prepared in the same way, and in the same proportion, upon the other infected animals.

Signor Malinoeni, of Collobiano Vercelles, who had a stable with about 100 cattle, had already lost 40 cows, 6 young cows and 8 calves. Of 24 cows stricken, 6 had recently died: 2 on April 5th, 2 on the 6th, 2 on the 7th. Of 16 calves stricken 6 had died also. After the injection of hemo-aphthine in the established proportion, *i. e.*, about 300 gm. for the cows, and 75 to 100 gm. for the young cows and calves, we noticed here also the quick resumption of the eating process, vivacity, and entire health, within a few days.

At St. Bartholomew, of Vercelli, of more than 25 cattle, 6 had already died, 2 cows on the 10th and 11th, 2 on the 12th, and one on April 14th, 1901.

The 19 young and old cows subjected to inoculation of proportioned doses of hemo-aphthine, were all cured in a short time, with the exception of a cow gravely affected with tuberculosis, which afterward was sent to me at my laboratory in Turin, and served for experimentations and studies. On the same evening of the 14th, with Drs. Tambornino and Borge, veterinary doctors of Vercelli, I inoculated also 6 healthy cows of the same proprietor, placed in a healthy stable, at the end of the yard of the same farm, with 300 gm. of liquid, leaving full liberty to the persons to go in the stable where the cows were kept.

None of them contracted the disease any more; therefore, they were regarded as immunized against the very malignant aphtha, due to the common means of contamination, as those alluded to by Löffler, and which, as they had been ignored by him, he would still experiment and study.

In that stable I had also the occasion to make an important observation relative to immunity. The stable, very roomy, comprehended two parts, communicating with each other, only divided by the entrance door (right and left) so that the left contained the cattle belonging to the proprietor, 25 in number; the right those of a Lombard gentleman of Bergamo, coming from the province of Como, near Lecco, from Val Sassina. The cattle of the proprietor which had not yet had aphtha, were all gravely infected, and had the losses already indicated. The cows of the Lombard gentleman, numbering 40, which had aphtha last year, remained perfectly immune, while 16 young and old cows which had not yet suffered from aphtha and were mixed among them, contracted the disease and 2 died. Therefore, also, the remaining were inoculated with a curative dose of hemo-aphthine, with perfect success.

Dr. Tambornino, veterinary doctor of Vercelli, had made trials of immunization, using hemo-aphthine which I supplied.

He proceeded in his experiment as follows:

Having chosen two cows from a well-known healthy stable, after a day of rest in a disinfected room of the slaughter-house, he inoculated them under the skin with a gramme of hemo-aphth-

ine for each kg. of weight of the dead animal, deducting the intestines, as I had suggested to him. Eight days having elapsed, and having already established the normal temperature of the two animals, on the ninth day he proceeded along to the aphthosation by means of saliva and secretion taken a few hours before from various cows, among the most gravely stricken with malignant aphtha on a farm a little distance from Vercelli.

Four days later the symptoms characteristic of the disease were manifested in one, and six days later in the other. In both, however, the disease was of a benignant form. The two beasts continued to eat hay, notwithstanding they presented aphtha at the mouth and feet, and without any care they were quickly healed. Evidently the hemo-aphthine did not produce a complete immunization, which, however, was overcome only by a great quantity of virus artificially inoculated by the aphthosation process.

Now, by the researches of Löffler we can explain why Dr. Tambornino could not obtain the complete immunity in the two animals on which he experimented, and why, on the contrary, it was obtained in my trial made at St. Bartholomew, of Vercelli, on the six cattle not yet affected by aphtha.

In that same memorandum, Dr. Tambornino described the excellent results obtained in the cure of the malignant aphtha by means of the same hemo-aphthine, on more than 150 head of cattle, of different ages.

For all this, it seems to me that the time has already come when the greatest impulse must be given to the serum-therapy of the epizootic aphtha, or better, to the hemo-therapy, in order to obtain a material of easier preparation and cheaper too, especially in our country, where the aphtha is making such frequent appearances, followed by great damages.

DR. L. VAN ES, professor of Veterinary Science in the North Dakota Agricultural College at Fargo, successfully underwent the classical operation for appendicitis during the past summer.

ANTHRAX AND BLACK-LEG.

BY CHARLES H. HIGGINS, B. S., D. V. S., PATHOLOGIST, DEPT. OF AGRICULTURE, OTTAWA, CANADA.

A Paper presented to the 40th Annual Meeting of the American Veterinary Medical Association, at Ottawa, Can., Sept. 1-4, 1903

The title of my paper was not selected on account of its scientific value, nor on account of any original work accomplished by the writer in connection with either affection; but, rather, with a view to giving a comprehensive idea of the differences between these two affections to the general practitioner, which will enable him to more easily make a correct diagnosis, thereby causing a financial gain, not only to himself, but to his client as well.

Some criticism may be offered at the commonplace term used ("black-leg"), but I consider this advisable, owing to the idea which has gained ground in some sections and I am sorry to say by some professional men, that the two diseases are similar in their nature and the methods of inoculation for their prevention.

The history of either disease can be traced back through the preceding centuries with little difficulty, even though the exact nature of their causative agent was an unknown quantity.

At the present time, through the perfection of our microscopes, we are able to detect the infective agent, not only of these two diseases, but the infective agent of the majority of the contagious diseases of man and animals. It is then apparent that we are indebted to the perfection of our microscopes, not only for the detection of the infective agents of the contagious diseases, but also for our present knowledge of their prophylaxis and preventive treatment.

To deal progressively with these two affections, I will cite circumstances which the country practitioner is liable to encounter in the regular routine of his practice at any time.

His services are required immediately, some cattle are dead, others are in a dying condition, the owner or owners are ex-

cited, and from the quick onset of the disease and the almost total absence of symptoms, immediately suspect poisoning by a near neighbor with whom they are at loggerheads.

A careful and quick diagnosis is imperative, not only for the protection of the other animals on the farm, but, if the case be anthrax, for the protection of the human beings who may come in contact with the animals or their products after death.

In anthrax, the diagnosis may be established by the short duration of the illness; the animal may be of any age or variety; as a rule, appearing in perfect health the night before, and being found dead or nearly so in the morning. There is usually a bloody discharge from the nostrils and anus. This in itself should arouse suspicions and make one particularly careful in handling the carcass, that he may avoid infecting himself or others, or distribute the infection over the ground when removing the carcass to a suitable place for burial. If there is still doubt, a few drops of blood may be obtained on a clean piece of note-paper, allowed to dry in the air before being folded, and forwarded by mail to a laboratory for microscopic examination, which examination will yield positive results.

If it is necessary to confirm the diagnosis immediately, an autopsy may be performed, but it must be borne in mind that this is a very dangerous procedure and one which can usually be dispensed with even in the most remote sections.

At an autopsy on a case of anthrax, hæmorrhages will be noted throughout all the tissues and organs of the body. The spleen will be greatly enlarged and very dark in color. The blood flows freely, is of a dark color, tarry, and does not coagulate.

The carcass of such an animal should be destroyed by fire as soon as the diagnosis is made or suspected, care being taken that all discharges and litter about the animal be burned with it, even to the halter. The animal should, under no consideration, be skinned, as this is a most dangerous procedure; nor should it be dragged over the whole farm with a chain around its neck or leg that a spot may be found where the digging is

easy, for by this means the infection is very effectually spread, contaminating any enclosure through which the animal may be drawn.

Black-leg is a disease of the ox and is seen more often in animals from six months to four years old. Its onset may be slightly longer than that of anthrax, the first symptom usually being lameness. Later an emphysematous condition of the skin covering the muscles is noticed, which gives an increased size to the quarter affected and a crackling sound similar to the rustling of paper when the hand is passed over the area.

As a rule, there is no discharge from any of the natural openings of the body, of a bloody character. The blood is coagulated and of normal color. The spleen is normal. Congestion of the intestinal mucous membrane is at times present and there may be some hæmorrhages.

The skin covering the lesions is dry. The muscles are dark in color and decomposition takes place very rapidly.

The precautions taken in the handling of the carcass should be similar to those used in case of anthrax, although the danger to human beings is nil, but the danger of spreading the infection is as great.

With this disease, as with anthrax, there should be no difficulty in making a positive diagnosis in the field, but if it is desired to confirm the diagnosis, a few drops of bloody serum from the affected muscles, prepared in the same manner as blood from a case of anthrax, will yield positive results on microscopic examination.

Bacteriologically, the difference between the germs of anthrax and black-leg is as great as the difference in their lesions.

The anthrax germ is aerobic (*i. e.*, grows only in the presence of oxygen), non-motile organism, a characteristic being the chain formation in artificial media or in the tissues.

The germ causing black-leg is anærobic (*i. e.*, grows only in the absence of oxygen), and is actively motile. Chain formation is not a characteristic.

Both germs form spores, which spores are capable of retaining their infective properties for an indefinite length of time. Either germ is easily propagated provided suitable media and conditions are observed. Anthrax is easily stained, retaining the dye when treated by the Gram method. Black-leg bacilli are also easily stained, but do not as a rule retain the dye when treated by the method of Gram.

An opportunity for the treatment of animals affected with either disease is seldom obtained, and when such an opportunity is presented, it is usually fruitless.

The preventive inoculation against both affections is widely practiced, particularly in localities where it is known the infectious agent exists. The attenuated virus for the preventive inoculation is prepared in laboratories especially equipped for the work, of which there are many on this continent, some connected with the Federal or State governments, others connected with firms who make a specialty of "biological products."

These vaccines when prepared with care and properly tested may be considered reliable. Anthrax vaccine as prepared requires two inoculations, the first preventing against infection by the second, and the second preventing against infection by a virulent germ. The interval between the two inoculations varies, but is usually from ten to twelve days. Black-leg vaccine is sold in two forms, the single and the double vaccine. The single vaccine is usually recommended for grade stock, while the double is for pure-bred animals; it being considered that a single vaccine which will act as a preventive against an active infective agent, is too strong for pure-bred animals, which are considered more susceptible, owing to their high breeding. The results of vaccination against either infective agent are considered successful. The method of applying black-leg vaccine is various and is usually characteristic of the manufacturer, each firm desiring to obtain a method which is very efficacious and simple that it may be placed in the hands of the layman as well as the veterinarian. The results of vaccination against either infective agent, are considered successful.

THE BANG SYSTEM FOR ERADICATING TUBERCULOSIS AS PRACTICED AT PINE GROVE STOCK FARM, ROCKLAND, ONTARIO.

BY HON. W. C. EDWARDS, PROPRIETOR OF PINE GROVE FARM.

Read on the occasion of the Visit of the American Veterinary Medical Association to Rockland, Sept. 2, 1903.

I have been asked by Dr. Rutherford, Chief Dominion Veterinary Inspector, to read, on this occasion, a paper on the Bang System for the eradication of tuberculosis as practiced on our farm here. This is a subject more properly to be dealt with by a professional man than by a layman. However, if in what I have to say on the subject I express opinions which may be at variance with the accepted theories and practice of the profession, I am fully aware that the consideration due to a layman dealing with such a subject will be accorded me by the profession, and before launching out to give expression to our experience and my views upon this most important subject, allow me to express the great pleasure and gratification it affords me to see here to-day this assemblage of so many members of the veterinary profession from all parts of the United States and Canada, as well also as the medical men and others who are interested in the promotion of the health of our animals, animals so closely allied with human life.

Referring to the close alliance and association between human beings and domestic animals, and recalling the statement made by the great German scientist, Dr. Koch, something about two years ago, the question of tuberculosis in our domestic animals would appear not to have the same significance as affecting human beings as was formally generally supposed. The relation or similarity as between human and bovine tuberculosis and the communicability from the one to the other is, however, one for scientific and professional men to thresh out. I will not presume to express any opinion on this complex question. I will be permitted, however, I am sure, to say that for myself I regard the safest course, while doubt still remains, is to allow

the doubt to rest on the side of the greater security and to continue to assume that there is danger until it is uncontrovertedly proven that there is no danger of human beings contracting tuberculosis in various ways from domestic animals so diseased. But even if, finally, it is proven that the disease is not communicable from animals to men, there is no reason why the efforts being made for the eradication of the disease in our animals should be stayed for a moment. In our best interests, having regard to the animals only, it is most highly desirable that the disease should be eradicated. It is to be found to the greatest extent in our pure-bred herds, the source from whence sires are obtained for the general improvement of the herds the world over, and unless our pure-bred herds are cleansed of the disease, the process of spreading it will go on until it pervades the entire live-stock interests of each country where it is not eradicated, and the extent to which it will be injurious to the live stock of each country will be measured by surrounding conditions, and the loss of animals will be measured largely by the general sanitary or unsanitary and other conditions prevailing, so that, regardless of the matter of the danger to human life, it is highly in the best interests of the stockman that his herds and flocks should be free of disease of every nature, and the question arises: Can tuberculosis, one of the most constant diseases present in our animals, be eradicated? My answer is "YES," most emphatically. It can be done, and once eradicated, by reasonable care, healthy herds and flocks in this respect can be maintained, and the system we recommend is the Bang System, which has been rigidly practiced on this farm since the year 1898. In the spring of that year, intending to ship some young bulls to Wisconsin, we asked our Dominion Veterinary authorities to test them, and to our surprise and regret it was found that all responded to the tuberculin test. This was our first knowledge of the existence of the disease in our herd. For a few days we were undecided what course to pursue, but on consultation with the Hon. Sydney Fisher, our Minister of Agriculture, who recommended testing the whole

herd, and who further urged upon me the advisability of adopting the Bang System for the eradication of the disease, and on our consenting, he at once placed us in communication with Dr. McEachern, the then Chief Dominion Veterinary Inspector, who immediately had the entire herd tested, and gave us full information and instructions as to the Bang System. The greater part of the herd responded to the test, and a separation was at once made of the healthy from the diseased animals. The decision was to weed out and kill all but animals of desirable pedigree and individuality, and the slaughtering took place under veterinary inspection. Of the fifty to sixty animals slaughtered, only three proved unfit for human food, but in all traces of the disease, in a more or less degree, were found, but, in most cases, very trifling traces of it. The stables formerly occupied by the herd were most thoroughly disinfected for the reception of the healthy animals, and entirely new premises were erected for the diseased animals we retained in our herd, and in like manner the diseased animals have been kept in separate and distinct pastures from the healthy ones since that time and have never mingled in any way.

In the inception of our experiments, we sterilized the milk from the diseased cows, as directed by Dr. McEachern, and fed the calves with the pail. This plan we found successful in so far as raising sound calves was concerned, but it is a somewhat troublesome one, and, further, we lost a few calves, as we believed, from the fact that they were so fed at once without first taking the mother's milk in the natural way. This plan, while successful, we have discarded entirely, and we have adopted the plan of raising the calves on nurse cows, allowing the calf always to suck the mother once before making the change. This plan we found most successful in every particular, and in the practice of either of these plans described, we can vouch for it from our experience that healthy calves can be most successfully raised from diseased dams or diseased sires and dams, and if all is carefully carried out, the percentage of diseased calves raised will be very small indeed, so small that it need hardly be con-

sidered. In our experiments, everything has been entirely satisfactory to us, and we strongly recommend the practice to our brother breeders, many of whom, we are sorry to say, have, up to this time, resisted the advice in this respect of our veterinary authorities, both in the United States and Canada, and the subject has been a most controversial one. We can only say, for our part, that after a very considerable experience we are firm believers in the Bang System, and we are believers in the tuberculin test as the only present means, so far as we are aware, of ascertaining the existence of the disease. The only failure, so far as we have knowledge of, is in cases where the disease is in such an advanced stage that reaction does not take place. In a well-conducted herd, such cases will be few and far between. Further, we have experienced none of the unfavorable results that are put up by those opposing the test. In no case have we known, in the many hundreds of animals we have had tested, of any injury to any animal, neither have we experienced any trouble in abortion in cows tested, and we have had them tested at all stages of pregnancy.

We are firm believers in the tuberculin test, as we have described, and we are also firm believers in the Bang System, and until these are improved upon—if they can be improved upon—we shall practice both in the management of our herd. No matter what the practice and requirements of our Government authorities may be, we, on our part, shall not relax our efforts in the direction I have stated until all our herds are absolutely free from the disease, and until better means are known, we shall always use the tuberculin test to ascertain the conditions of the health of our herds.

Having given our practice on this farm, I may now be permitted, perhaps, to make a few general remarks. The discovery of the extent of the disease in the herds of various countries a few years ago caused such a commotion that most rigid enactments were passed by several legislative bodies; extreme conditions were imposed, doing, unfortunately, in our opinion, a great deal of harm, arousing the antagonism of breeders and

stockmen. Much of this legislation has been rescinded, and more reasonable measures are now adopted as a result of a greater knowledge of the subject. Mistakes, if there have been mistakes, were not wilful, but well intended, on the part of the authorities of each country, but we submit that if the disease is to be eradicated from any country it must be through a campaign of education and united effort on the part of the breeders. The exclusion of importation will never help just so long as the disease exists in the herds of the importing countries, and our veterinary authorities will do well to show the simplicity with which it may be eradicated, rather than impose unnecessary conditions. Apart from the test and the application of the Bang System, cleanly and sanitary conditions, good ventilation and plenty of sunlight, and as much outdoor life as possible, are the requisites. To the beginner in stockbreeding, we would advise that he begin with animals free from disease and that he attend well to his ventilation and sanitary conditions, and if at any time he buys to strengthen his herd, to see to it to a certainty that he does not buy disease with the animal. To the breeder, small or large, who discovers the disease in his herd, if the animals are of inferior pedigree and individuality, we recommend turning off to a butcher to be killed under veterinary inspection, all animals that respond to the test, but in no case would we recommend the slaughtering of valuable animals where they are still in good breeding form, but we advise the system of separation. The same measure of separation may not always be possible, but the best that can be done should be done in each instance, and do not neglect the sanitary matters spoken of in this paper. I am fully convinced of the reasonable possibility of the eradication of tuberculosis from our herds and of the maintenance of sound herds, and my earnest hope is that our breeders may at no distant day be so educated in the direction I have endeavored to describe that they will put into practice the only present known means of ridding their herds of a disease which in the past has been so destructive in its consequences.

THE "CRAB" OR "FORGER."

COMPETITION FOR THE PRIZE OF TWENTY-FIVE DOLLARS OFFERED BY DR. WM. DOUGHERTY.

FIRST PAPER.

BY NO. ONE.*

In the October number of the REVIEW Dr. Wm. Dougherty offers a prize for the best essay on forging, dividing the subject under two heads:

(1.) Is the horse sound? Meaning, we will suppose, Is forging unsoundness? We will answer, no. While an unsound horse may forge, it is incontrovertible that many sound horses do forge. This being true, forging cannot be considered unsoundness.

(2.) Where is the lesion? We deny any pathological condition existing. Therefore, will not pursue this division further.

A somewhat extended experience on the road and track leads us to the conclusion that forging is either a fault of disposition or conformation; often both combined. Most forgers do so at the trot. We will treat of the fault at that gait. The horse is a very complicated piece of machinery, which for convenience we will regard as having the form of a parallelogram having a pendulum at each right angle. As with the horse at the trot an anterior and an opposite posterior pendulum oscillate at the same instant. The range of the pendulum's oscillations being greater than the length of the body, each posterior pendulum must pass its corresponding anterior one at some point of each oscillation or they will collide. This may be accomplished in one of two ways. Either the pendulums must vary from a true line to allow them to pass or the anterior must rise enough to allow the posterior to pass under. We have this same problem of passing the limbs at the trot. In low-gaited animals this is attempted at or near the ground and in case of

* The identity of the author remains the property of the editors of the REVIEW, until the judges have rendered their decision, the merits of the various papers to be decided upon by numbers only. For conditions of competition see October REVIEW, page 628.

interference causing their shoes to strike, called "forging." In the higher acting horse the interference comes after the anterior limb has completely left the ground and is then called "speedy cut," and may occur at any point from the coronet to high on the cannon bones. In the symmetrical trotting gait the anterior limb would be elevated at the instant the posterior limb was descending, thus leaving the body for an instant suspended in the air at each stride. The abductor muscles would rotate the posterior limb outwards and the adductor muscles would rotate the anterior limb inwards, thus passing them safely and producing a frictionless gait. Low, heavy-headed horses are very apt to forge when extended. Many horses forge from heedlessness. Again, many road horses forge only when weary. Others forge only when jogging, going clear the instant they are extended. Bad shoeing may be the cause of forging by changing the length and direction of the stride. There is not space in an article of this kind to give a remedy for the different kinds of forgers, and this paper was to be confined to etiology; but will venture that the majority of forging horses are in the hands of slack-rein drivers.

* * *

SECOND PAPER.

BY NO. TWO.

For a proper and comprehensive explanation of this defect in the horse's gait, the task is rendered difficult through the allotted space, and more so through the questions, which hardly have any relation to this abnormality whatever. Our literature on this subject is very meagre, and to my recollection we find only some description of it with its shoeing in the books on "Horseshoeing," by Gutenacker, Lungwitz, Dominik, Teuch, Lesbre, and others.

Soundness has to be taken in consideration first, which should have been mentioned either in the second place or in the *résumé* only, if at all, after pointing out the different causes. Then, generally speaking, we have to understand under a forging horse a sound animal, because there is no diseased condition

of any part, and the few instances where forging is the result of disease, lameness or overwork, we easily can overlook, as in these cases forging only will be temporary and disappear with the improvement of the animal's condition.

After stating why a forging horse has to be called sound, we come to the second point, the location of the anatomical lesion, for which expression Mr. Dougherty should have said, defect from the normal of the anatomical structure, which would have been more to the point and more correct, and made the work easier for the essayists. But, as it is, we have to call a lesion wherever there is a deviation of the outlines of a perfectly normal horse; in this case a lesion or discrepancy rather in the conformation of legs and body.

For instance, the body is too short in proportion to the length of the legs (or the legs too high for the length of the body), "too much daylight under the horse," as it is commonly called. Further, a horse is apt to forge, if the foreleg stands too far backwards and the heel consequently has to bear too much weight of the body, or the position of the hind foot is nearer the point of the body's gravity than it ought to be.

So far, I have mentioned the causes which lie in the natural condition of the horse's faulty formation; besides I dare not forget to say that forging comes from badly prepared feet by the shoer or wrong shoeing. In one case the blacksmith might cut the heels too low or leave the toe of the front foot too long, and *vice versa* with the hind foot; also the shoe of the front foot might be too long and extend too far back, or ill fitting, by being too wide.

By summing up all these points, we have to state that forging is not a question of soundness, but an abnormality in the horse's gait, resulting from improper proportions of the different parts to each other in the anatomical conformation, or from unscientific shoeing.

DR. F. A. ZUCKER (A. V. C., '96), of Elizabeth, N. J., was an occupant of a bed in the hospital during November with appendicitis.

THE VALUE OF ANTISEPTICS IN DESTROYING THE VIRUS OF RABIES.

BY RICHARD PRICE, V. S., ST. PAUL, MINN.

Read before the Minnesota State Veterinary Medical Association, July, 1903.

The usual course pursued in treating dog-bites in people is to cauterize either with stick silver or actual cautery. Only in cases of superficial wounds or mere abrasions of the skin can such treatment be of much value.

As will be shown further on, the destructive power of caustic silver and carbolic acid on the virus of rabies is very weak, and as these are the remedies mostly applied it is no wonder so many die from hydrophobia after imaginary security procured by such treatment of the wound.

In animals, dog-bites frequently extend subcutaneously for many inches beyond the points of puncture produced by the tusks, in the skin. Recently a fox terrier was brought to the infirmary with a lame leg caused by the bite of another dog. Only two punctures were visible, one on each side of the arm near the elbow; on probing it was found that the wound extended to the carpus, a distance of four inches or more. How does this happen? The only solution to the question I can give is that the skin being loose, and the connective tissue elastic, the tusks tear through the more delicate subcutaneous tissues, lacerating them but not the tough skin beyond the punctures.

In treating wounds produced by dog-bites, first anæsthetize the parts with eucaine solution, or other similar preparation, then dilate the sinuses, if any, by injecting a solution of hydrogen dioxide, to render discovery of the extent of the wound easier; then flushing the wound out repeatedly with one of the following antiseptics in appropriate solution, as they have been proved by Italian and other investigators to be the most potent to destroy the virus of rabies: Lemon juice, creolin, ferric perchloride, hydrochloric acid, etc.

Furthermore, fluids are much more likely to reach the deeper parts of a wound than either stick caustic or the actual cautery.

The value of antiseptics in destroying the virulence of rabic virus is given as follows:

Lemon juice destroys it in 3 minutes.

Creolin (1 per cent.) destroys it in 3 minutes.

Ferric perchloride (2 per cent.) destroys it in 5 minutes.

Sulphate of copper (10 per cent.) destroys it in 5 minutes.

Cinnamin destroys it in 5 minutes.

Hydrochloric acid (5 per cent.) destroys it in 5 minutes.

Nitrate of silver (50 per cent.) destroys it in 5 minutes.

Nitrate of silver (saturated solution) destroys it in 5 minutes.

Nitrate of silver (25 per cent.) destroys it in 10 minutes.

Caustic potash (saturated solution) destroys it in 10 minutes.

Liquor ammonia destroys it in 10 minutes.

Sulphuric acid (10 per cent.) destroys it in 10 minutes.

Iodol destroys it in 10 minutes.

Boracic acid (4 per cent.) destroys it in 15 minutes.

Iodoform destroys it in 20 minutes.

Potash permanganate (1 per cent.) destroys it in 20 minutes.

Carbolic acid (5 per cent.) destroys it in 20 minutes.

It may surprise a good many to study the above table, especially when it is seen that carbolic acid stands at the bottom of the list and creolin at the head. It is, however, a well-known fact that either acids or alkalies weaken or neutralize the effect of a solution of rabic virus when inoculated experimentally into rabbits, and that an absolutely neutral solution is necessary in order to have uniform results. Even when a rabic brain or cord is preserved in glycerine, unless the latter is neutral the virus becomes destroyed very rapidly and no results may follow inoculation, even from rabic material. It is obvious how much danger may result from ignorant or careless methods in preparing the brain for diagnostic purposes.

That carbolic acid has very unreliable destructive qualities on the virus of rabies, was unfortunately demonstrated about four years ago in Chicago. Dr. Lagorio, of the Chicago Pasteur Institute, reports the case. "A boy had the skin on his hand slightly abraded by the tooth of a rabid dog. The wound was, within a very short time, cauterized with pure carbolic acid by a physician; six weeks later the boy died of hydrophobia."

The fact that lemon juice can be procured in nearly every American household, is strongly in its favor, as is the fact of its being fluid, and furthermore much less painful than either caustic or actual cautery, besides having a much more powerful and reliable effect in destroying the rabic virus.

Experiments conducted by de Blasè and Travali (quoted by Dr. A. Marie) showed "complete inactivity of an emulsion of a rabic cord in a 1 to 1000 solution of bichloride of mercury injected immediately on mixing. Also of emulsions in a 2.5 per cent. solution of potash permanganate, and in those of 50 and 90 per cent. alcohol inoculated after 24 hours. An emulsion in 25 per cent. alcohol inoculated after 24 hours, developed rabies in eight days; it took five days to render it inactive."

An emulsion of rabic cord rendered distinctly acid to test paper by adding one or two drops of acetic acid, or distinctly alkaline with a small crystal of soda carbonate, is rendered inoffensive even in large doses. Carbolic acid from 5 per cent. to 2 per cent. destroys the virus only after one or two hours respectively. Boric acid in fifteen minutes, lemon juice in seven minutes, nitrate of silver is mediocre; the sulphates of copper and zinc, ammonia, hydrochloric and sulphuric acids are active. According to Bokai and Szilaggi, ten drops of a solution of chlorine in 10 grammes of distilled water completely destroys the virus, as do bromine water and essence of eucalyptus.

The uncertainty of destroying all the virus in a wound, no matter how thoroughly disinfection and cleansing with the most potent antiseptics is carried out, necessitates the further precaution of adopting the Pasteur treatment in order to lessen the chances of a fatal development of hydrophobia in persons bitten by a rabid animal; and this should be administered *at as early a date as possible*. Every day of delay means a day's growth and development of the virus in the person's system; hence as many days as are let pass before commencing the Pasteur treatment means so many days' start. That is to say, if under no treatment the virus ordinarily would develop in 21 days, and the person did not present himself for treatment until

the seventh day, the danger of death from hydrophobia would be very great, as the ordinary treatment takes from 15 to 18 days and requires another week to produce its full immunizing effect on the system, and become protective. As there is no way known, at present, of ascertaining the virulence of the virus of street rabies, beyond that of inoculation subdurally of guinea-pigs or rabbits, etc., which requires from eight days upwards in the former and fourteen days upwards in the latter, there should be no delay in reaching the nearest institute where Pasteur's antirabic treatment can be secured.

Wounds on the head and face from the bite of a rabid animal develop the disease more rapidly than those on the extremities; those on uncovered, or bare portions of the body, prove more dangerous than on parts protected by clothing. Where a number of animals or people are bitten in quick succession, those attacked first are most liable to acquire rabies, unless protected by long hair or clothing, which seems to wipe the virulent saliva from the teeth.

A RAPID RECOVERY FROM FRACTURE OF THE OS SUFFRAGINIS.—A letter from Dr. T. S. Childs, Saratoga Springs, N. Y., under date of Nov. 12th, contains the following interesting item: "The great race horse 'Chuctanunda,' who met with an accident, causing an irregular fracture of the os suffraginis of the off foreleg, on Aug. 9th, 1903, while exercising on the Saratoga race track, was shipped to his Amsterdam (N. Y.) home to-day (Nov. 12th), comparatively all right, and practically sound. He will be retired to the stud. He was the champion sprinter of America in 1902, and valued at \$60,000. He is owned by Hon. John Sanford, of Amsterdam, N. Y., who is thoroughly well pleased with his condition. He was treated by Drs. R. E. Waters, of Gravesend, L. I.; Dr. T. S. Childs, of Saratoga Springs, N. Y., assisted by the kind advice of Dr. William Sheppard, of Sheepshead Bay, L. I., and Prof. Andrew Smith, of the Ontario Veterinary College, Toronto, Canada, who was called in consultation. I will give you a full report of the case later."

LOU DILLON, 1:58 1/2, wears no check rein and trots in an open bridle.

WILD ANIMALS IN DISEASE.*

BY W. REID BLAIR, D. V. S., NEW YORK CITY.

The care of wild animals in zoölogical parks is usually entrusted to "keepers" of the widest experience that can be obtained. These men as a rule, are sympathetic and intelligent—two qualifications requisite for a man to become a successful keeper.

He who is most familiar with the appearance and deportment of a wild animal in health, at the various periods of its existence, will most readily appreciate all departures from the normal.

The careful study of different species of animals throughout their growth and development by one of good powers of observation, and a reflective habit of mind, is of great value.

The difficulty in arriving at a true diagnosis is greater in wild animals than in the domesticated species. Where docility is a pronounced factor, one arrives at a diagnosis by a process of elimination; by the use of the thermometer, the pulse, percussion and oscultation of chest cavity, and otherwise handling the patient without causing undue excitement.



Monkey with fractured arm.—The collar of wood prevents animal tearing off bandage.

* From the *Zoölogical Society Bulletin*, October, 1903.

The physical examination of a few of the smaller animals—especially the monkeys—is comparatively easy ; but not so with one of the larger primates. An orang, baboon or large macaque may be so nervous or ferocious as to make a physical examination not only extremely difficult, but many times even impossible. Great care must be taken in handling all members of the order of Primates as they are very sensitive creatures, of strong likes and dislikes, and very good memories. This I have observed on several occasions. One of them may be so treated that it would be almost impossible for the same person ever to succeed a second time in examining him. However, if the subject has the good sense to realize that no harm is meant, he will usually quietly submit, according to his natural amiability.

Before making an examination of a patient, the "history" of the case is obtained from the keeper ; and upon this much depends. To the experienced it means a great deal, and upon it, alone, a fairly safe diagnosis may often be made.

In many instances the disorder is readily apparent, and the exact location of it detected. Coughing, and rapid or difficult breathing point at once to the chest as the seat of the trouble. In many other cases, much greater difficulty is experienced. Patient watching, with a careful analysis and study of each individual case, however, usually dissipates all doubt.

When an animal is ill, it is, if practicable, removed from its fellows, whether its disease be contagious or not. In the former case the reason is obvious, but in all cases, quietness and extra comfort are needed. The patient can be better observed, the symptoms more closely noted, and the disease from which he suffers more clearly defined when it is alone, and left to the exercise of his own undisturbed will.

An important object in giving medicines to these animals is to concentrate drugs as much as possible. It is best that the animal should not know that it is getting medicine at all, so it becomes necessary to disguise the drug in some way.

Modern pharmacy has provided a large number of preparations for the practitioner of human medicine, which in some re-

spects are far more necessary to him who ministers to sick animals, which cannot understand the object of what must seem to them ill usage.

Again, there is every reason why they should get their medicine in the way that will cause the least disturbance of their feelings, and without that excitement which may follow a struggle to give medicine. Small pills, gelatin-coated, or sugar-coated, sweet lozenges, tablets or gelatin capsules, carefully concealed in an innocent-looking banana, may be administered to an unsuspecting ape, without the slightest trouble. Occasionally, however, he may suspect, and great is your dismay at seeing him minutely pull the banana apart, find the offending pill, test it with his teeth, smell of it, and finally, with a wry face, cast it through the bars of the cage at his keeper.

The nursing of sick animals is of the greatest importance. The essentials are pure air, sunlight, cleanliness and warmth, nourishing and sustaining diet. During convalescence, all kinds of food may be offered to tempt the appetite, first one thing and then another; but no food should be allowed to remain before the animal, because the very fact of its being constantly present will cause him to loathe it.

When an animal has no appetite, the stomach is not in a proper state to digest food—consequently, if forced upon him, it will cause indigestion and aggravate the case.

“YOUR journal is much appreciated, and the future issues will be looked forward to with pleasure.”—(*Walter A. Stuhr, D. V. M., Ames, Iowa.*)

CARE OF ROYAL DOGS.—Emperor William has four light brown dachshunds, of which he is fond. These favorites, named Herr, Dachs, Bella and Liesel, live in a stone, ivy-covered house in the Park of Monbijou. They have their own cook and an open fireplace before which they can doze. Their dining room is hung with portraits of the dogs' high-bred ancestors and other dog pictures. Every second day one of the Emperor's gamekeepers visits the four dachshunds to see if they are properly cared for.

HISTORY OF THE TEXAS FEVER QUARANTINE LINE.

BY DR. W. N. D. BIRD, BUREAU OF ANIMAL INDUSTRY,
BUFFALO, N. Y.

Read before the New York State Veterinary Medical Society, at Ithaca, Sept. 16, 1903.

Up to about 1890 very little attention had been paid to the enforcement of any National Texas Fever Quarantine; in fact, there was hardly any line known, compared to the line as it exists to-day. The loss to the cattle interests of the United States was appalling, caused by the indiscriminate driving and shipping of Southern cattle to the Northern ranges. Up to 1885 about all the restriction on the Southern cattle traffic was promulgated by some of the Northern and Western States and Territories, restricting the introduction of Texas or Cherokee cattle, as they were then called, to a certain period of the year. Illinois passed a law as early as 1867, and amended it in 1869, stating that no Texas or Cherokee cattle should be brought into the State of Illinois, except between the dates of October 1st and March 1st of the following year. Kansas passed a law in 1884 prohibiting the introduction, or the passing on foot through the State of any cattle capable of communicating Texas fever. Cattle which on affidavit were known to have been kept since the first of the preceding December in that part of the Indian Territory west of the east line of the Territory and north of the 36th parallel of north latitude, or west of the 21st meridian of longitude, and north of the 24th parallel of north latitude, could enter Kansas at will. A few of the other Western States and Territories passed and endeavored to enforce similar laws, governing the transportation of Southern cattle. One of the earliest regulations I can find which has as its object the prevention of the spread of Southern cattle fever infection, was promulgated by Messrs. J. H. Payne, H. M. Taylor and J. H. Fullin Wider, agents of the Bureau of Animal Industry at Topeka, Kansas, August 1, 1884, and was as follows: "Being requested by representatives of various railroad companies to make such suggestions as in our opinion would tend to prevent the spread of any

contagious disease among cattle, carried by them, we the agents of the Bureau of Animal Industry appointed by the Commissioner of Agriculture, respectfully recommend to all railroad companies engaged in the transportation of live stock, that all cars used in such traffic be thoroughly cleansed and washed immediately after unloading of stock, and further that any cars that may have been used in the through shipment of Texas cattle or cattle liable to communicate Texas or splenetic fever shall be disinfected by the use of quick lime. It is further recommended that the stockyard companies set aside certain pens for native, and that they be thoroughly washed and cleansed as above. During the season of 1885 the Bureau of Animal Industry through its inspectors spent a great deal of time and labor collecting information and data regarding the districts permanently infected by the Southern cattle fever infection ; to facilitate the work, a circular letter was sent out by the Commissioner of Agriculture, Norman J. Colman, addressed to the Texas cattle owners living in certain districts of Texas, naming a large number of counties, asking for information as follows : 1st. Have you purchased any bulls or other cattle, or do you know of any that have been brought from the north of the south line of Kansas to your vicinity, or to any part of the counties named above ? If so, state the numbers, the location as near as possible to which they were taken, and the number, if any, which have died of acclimation fever. 2d. Do you know of any cases in which cattle from the eastern counties of Texas have been taken to the counties named above in the spring or summer months, and allowed to pasture on the same ranges with cattle native to the counties ? If so, state if any disease occurred among the native cattle, and give symptoms and numbers affected as far as possible."

Answers to this circular were received and information by employés of the Bureau was obtained, and as far as possible at that time a line was established showing about where the northern limit of the infection existed, and the next two or three years the Bureau worked to find if possible the exact area and northern line of infection. In 1889 the Secretary of Agriculture

issued a proclamation to the railroads and transportation companies of the United States, stating a contagious disease called splenetic or Texas fever existed among cattle in the following described area of the United States: all that country lying south and east of line commencing at the northeasterly corner of Crittenden County in the State of Arkansas, then running in a northwesterly direction to the Osage Agency in the Indian Territory, and thence running southwesterly to the Rio Grande at the intersection of the southeasterly corner of the Pecos County and the northeasterly corner of Presidio County in the State of Texas. No cattle should be transported from said area north or west of the above described lines under certain restrictions. Cattle unloaded for feed were to be kept in pens and enclosures set aside for this purpose alone and the pens to be cleansed and disinfected at least once a week until the frost of December. A subsequent order of the Secretary dated November 1, 1899, revoked the quarantine regulations, as the danger of the infection had passed for that year. In 1885 the splenetic fever was a great disturber of cattle values; thousands of dollars worth of cattle died from the disease and commerce between the States had been so unsettled that cattle values were estimated to have depreciated \$50,000,000 or more; in consequence trade between North and South had been paralyzed.

Cause of splenetic fever in 1885 was supposed to be a parasitic vegetable germ which is supposed to live as a parasite on the grasses of those sections of the Southern States bordering on the Gulf of Mexico and northward along the Atlantic coast as far as North Carolina. The climatic condition peculiar to this section of the country seemed to be necessary for the propagation of this germ as a vegetable parasite—that is, to enable it to fructify, producing spores which will under favorable climatic influences reproduce the original germ. This germ is destroyed by frost.

During 1889 Kansas employed inspectors at different points to inspect cattle by their brands, as it was known that range of brands of cattle which were known to be infectious was below the danger area already described. The present chief inspector

of the quarantine west of the Mississippi, Col. Albert Dean, was one of these inspectors employed by Kansas at the Kansas City Stockyards to detect cattle with prohibitive brands and prevent their introduction into Kansas. In a letter to the Secretary of Agriculture, dated Feb. 27, 1890, L. A. Humphrey, Governor of Kansas, stated that as the State of Kansas, as it was geographically situated, was greatly exposed to the introduction of Texas fever, and sent a set of resolutions issued by the Live Stock Sanitary Board of Kansas, recommending several things which stated that as the State Legislature had failed to appropriate sufficient funds to pay inspectors at the suggestion of the Board, the Kansas City Stockyard Company and four prominent railroad companies assumed and paid the expense of five inspectors up to Dec. 1, 1899. These inspectors were very successful in their inspection, causing the loss from Texas fever in the State to fall to a minimum. The plan of inspection by these five inspectors was inspecting entirely by brands, in the knowledge of which they were especially expert, and giving no credence to any statements or history not agreeing with the origin shown by the brands, and that they have thus demonstrated absolutely that this is the only way to inspect against Texas fever with any guaranty of success.

The Board went on to say that the expense of these inspectors has fallen on Kansas and certain corporations, but other States and Territories were benefitted by their inspections, and the inspection under the authority of Kansas bore no weight with other States or the countries of Europe, whereas if the Government of the United States should assume and control this inspection, there would be great advantages gained for the cattle industries. Resolved that it is the sense and opinion of the Live Stock Sanitary Commission of Kansas that the inspection of all cattle being moved across quarantine lines established by the United States Government, should be made by inspectors appointed by and under salary from the Government. Acting from these suggestions and from demands of cattlemen throughout the United States, the Bureau in the year 1890 as-

sumed charge and supervision of the quarantine and transportation of Southern cattle, stationing Col. Dean, Chief Inspector of Kansas City, and a number of inspectors or live stock agents at such points as Argentine ; Parsons, Kansas ; Springfield, Mo.; Herington, Kansas, on the lines of the principal railroads carrying Southern cattle. These inspectors saw the cattle originating below the established quarantine line, by stamping the way bills and carding the cars.

These Southern cattle were routed to the quarantine yards of the principal live stock markets of the country. Information as to the destination of the cattle so inspected was mailed to Kansas City and from there to the point to which the cattle were destined.

At the end of the season of 1890 Col. Dean reported 21,292 cars of Southern cattle that had passed under the observation of himself and the several inspectors, and out of 70,000 Northern and Western cattle shipped from the Kansas City stockyards into Kansas, not one case of Texas fever was reported as originating from these cattle. Cars carrying Southern cattle were cleansed and disinfected before again being used for cattle traffic. There were only five outbreaks of Texas fever in Missouri and Kansas from cattle brought from Texas in February, 1890. About this time the investigation of Dr. Theobald Smith and F. L. Kilbourne as to the origin of Texas fever and its mode of propagation, was being published and known by the veterinary profession and the cattlemen. A most worthy discovery ; and the names of Smith and Kilbourne will be remembered as having advanced the cause of science. The mode of transmission being now known, further experience only being necessary, the quarantine line of this time on to the present depended on the existence of the cattle tick in that territory. The object of the department was to place it far enough north as above known infection to be on the safe side. From time to time the line is changed to fit the exigency of the situation in the different localities. During the fall the live stock sanitary boards of the different States and Territories meet in a national session and

talk over the situation in each locality. Some of the States through which the quarantine line runs often do not wish an open season—that is, a period generally from Nov. 1st to Jan. 15th, in which cattle can be moved in for feeding or grazing. Other States more northern do wish this open season, and this National Sanitary Board in session recommend to the Chief of Bureau of Animal Industry certain changes in the line and restrictions as to open season, and the chief generally complies with these suggestions, and the Secretary of Agriculture issues regulations to govern the operations of the quarantine line for the coming year, making a government proclamation with restrictions to conform to the States or Territories to which cattle may be shipped or driven. It will readily be seen that where a disease was a grave menace to the cattle industry ten or twelve years ago, without adequate knowledge of the disease, and with no national supervision of the movement of animals, where to-day the mode of infection is known, and where the movement of animals is under strict national supervision, the danger of susceptible animals becoming diseased is very small, and the loss to stock-growers by this disease is inconsiderable. To-day the quarantine line starts at the Atlantic seaboard and meanders in a westerly direction, sometimes on State lines, other times going through a State until it reaches the last line of Oklahoma Territory, thence in a southwesterly direction to the Rio Grande and along the Mexican boundary to California, and northerly and westerly to the Pacific Ocean; a proof of California being below the line.

Inspectors are placed at points generally on lines of railroads leading from the quarantine territory, and they report to headquarters the movement of Southern cattle and their destination. During the closed period of the year cattle below this line can only be shipped by rail or boat for immediate slaughter, and the cars and boats so used to be cleansed and disinfected before again being used. If at any time cattle above this line are found to be infectious (ticky), they are considered as "Southern cattle" and the locality is quarantined. The Secretary of Agricul-

ture from time to time amends the regulation to govern the case as it may exist in a certain locality, as reported by inspectors of the Bureau. To-day Texas fever has no terror as compared to a dozen years ago. Experiments are being made with different ingredients to destroy the tick, for the Southern animals without the tick are no more dangerous than the cattle of the North in spreading the infection. When a successful dip is found to destroy the tick without injuring the cattle, the quarantine will be almost a thing of the past. Again, the veterinary profession is aiding the stock-growers in producing in Northern-grown animals an immunity to the disease by serum treatment, and by inoculations by a few artificially-grown young ticks. In the experimental stations of Missouri, Oklahoma, Texas, and a few other States, this is being done with very good results, whereby breeding animals of the North can be shipped south with a very good guarantee of living.

This account will give you some idea of what has been accomplished by the Bureau of Animal Industry in the last fourteen years with a disease which at one time nearly paralyzed the cattle industry of the country.

OXYGEN TREATMENT OF MILK FEVER.—Drs. White and Plaskett, Nashville, Tenn., writes as follows under date of Nov. 24: "We have been using oxygen in the treatment of all milk fever cases since it was first suggested in the REVIEW. For the past four and one half months we have used it in a great number of aggravated cases with not a single fatal termination. Each cow made a quick and complete recovery, with none of the usual complications. The udders were scrubbed and rendered aseptic before the injection. The oxygen, which is in a forty-gallon tank under high pressure, is allowed to flow slowly through a small rubber hose, to which is attached an ordinary milking tube. The udder is inflated until well filled with the gas. The cow is placed in position on sternum and allowed to remain without further treatment of any kind. Its beneficial effects are noticed almost immediately. They are on their feet in from two to eight hours and convalesce quickly. From our experience with oxygen inflation of the udder, we are constrained to assert without the least hesitation that it is all, and even more, than has been claimed for it."

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

ACTINOMYCOSIS IN ANTELOPE.

By W. REID BLAIR, D. V. S., Veterinarian and Resident Pathologist,
N. Y. Zoölogical Park.

A short description of this animal may be of interest to the REVIEW readers. As many of you doubtless know, this familiar animal on our Western plains is being rapidly exterminated, and will in all probability be our next large species to become extinct.

With the possible exception of the small deer of Texas, the prong-horned animal is the smallest ruminant animal inhabiting North America, north of Mexico. It is the only living mammal possessing hollow horns (growing over a bony core), which sheds them annually. It is the only animal possessing a hollow horn which bears a prong or bifurcation; it has no "dew claws" as other ruminants have. The horns are placed directly over the eyes; the long hair of the body and neck is tubular; and that on the rump is erectile.

My attention was first drawn to this animal by the keeper, who said it had not been feeding for two days.

On going to the corral, we found the animal isolated, lying in one corner. There was a peculiar uneasy movement of its jaws, as if there were something in the mouth which could not be dislodged. While examining the mouth and head I found a swelling the size of a hen's egg on the left superior maxilla directly over the upper third molar. The swelling was hard and very painful, and with no evidences of any external injury; this, together with the knowledge of one previous case in the same herd, led me to diagnose it at once as actinomycosis.

The animal was removed from the herd and placed in a separate corral. With a strong hypodermic syringe the enlargement was impregnated with 40 grains of iodide of potassium in a watery solution. Two days later the swelling and surrounding tissues were painted with a strong tincture of iodine, and one drachm of iodide of potassium dissolved in the drinking water daily. On the fourth day the swelling was again injected with a strong solution of iodide of potassium.

The seventh day there was a profuse discharge from the nostrils, particularly the left one, of a white gelatinous, flaky substance. The enlargement seemed to be diminishing in size. On the tenth day the hair and skin over and around the swelling were exfoliated, leaving an ugly raw surface, which was dressed with xeroform. The patient up to this time was bright, appetite was fairly good, and seemed to have no difficulty in masticating its food; there was no appreciable failing in flesh. The case made satisfactory improvement for five weeks, with only a slight failing in condition of the patient. The wound on the jaw had healed nicely and the swelling had almost entirely disappeared.

A few days later while making an examination of the mouth to ascertain if any of the teeth around the swelling were loosened, I discovered an enlargement upon the lower jaw of the opposite side, at the angle of the inferior maxilla, which later proved to be another actinomyces abscess. It was thought best not to treat the animal longer, and it was chloroformed.

The autopsy showed that the first abscess had drained nicely, and that all of the diseased tissues had been exfoliated, leaving a clean dry porous surface behind.

The recent abscess on the inferior maxilla had involved a considerable portion of the periosteum and was beginning to affect the bone.

While I am in some doubt as to whether the treatment, if it had been prolonged, would have resulted in a cure or not, I am quite satisfied that the iodide of potassium treatment prolonged the life of the patient very considerably, as our experience with this disease among antelopes has demonstrated that it runs a very acute course, usually terminating fatally within two weeks from the first symptoms of illness.

FIBROMA.*

By THEODORE F. KREY, Student, New York City.

With your permission, I will be pleased to present for your discussion a paper on fibromata, which impressed me sufficiently to warrant its introduction, as the case seemed to me to be somewhat removed from the ordinary case of fibromata, as there was so little evidence of its presence.

Situated near the insertion of the triceps abductor femoris muscle, on the off external thigh, it caused the animal to go

*Read before the Ontario Veterinary College Medical Association, Oct. 16, 1903.

quite lame, and was quite hard and painful to the touch, the region of the tumor being but slightly swollen.

In compliance with the request of my preceptors, Drs. Hall and McCully, the animal, a fine chestnut gelding, was brought to the hospital and subjected to a thorough and rigid examination, at the end of which the case was diagnosed as fibromata, and an operation suggested, to which the owner consented.

In answer to questions as to the history of the case, the owner stated that a year previous, while being exercised, the animal fell and slid on the injured side, regained his feet, trotted lame for a few moments, then resumed a sound gait, and



nothing more was thought of the matter until several months subsequent, when he again went lame; was immediately turned over to a skilful veterinarian, but had failed to respond to treatment.

The *modus operandi* consisted of throwing and securing the animal, shaving the parts, scrubbing the parts with green soap and washing with antiseptics. We then injected eucani, 3 i, on each side of the proposed incision; an incision was then made about five inches long from above downward, and the tumor was plainly visible. With the aid of a scalpel, Dr. McCully soon cut it from its attachment on all sides, but it proved to be so tough and deep seated it became quite difficult to proceed with the scalpel; so we proceeded to thread the tumor, which was soon accomplished, using a heavy curved needle and heavy linen thread, which was passed directly through the centre.

This simplified matters considerably, as we could then draw the growth in any direction desired, thus enabling the operator to proceed with a heavy curved scissors to complete the excision of the tumor, the lips of the incision being held apart with two Volkman's retractors. The cavity was then thoroughly cleansed with $\frac{1}{2}\%$ solution of formalin, and packed with anti-septic gauze, and the operation completed by suturing with sterilized silk, using interrupted stitches, and then dusted with iodoform and boric acid powder, equal parts. The after-treatment consisted of daily syringing with formalin, creolin, and peroxide of hydrogen. The animal made a full recovery in about eight weeks, at the end of which time he trotted perfectly sound.

APLASIA OF THE LEFT SUPERIOR CENTRAL INCISOR IN A MARE.

By JOHN J. REPP, V. M. D., University of Pennsylvania,
Philadelphia, Pa.

The horses in a stable in an Iowa town were suspected of having glanders, and in making a physical examination of them, I noticed that a six-year-old standard-bred mare showed



absence of the left pincer in the upper maxilla. The mare was afterward found to be afflicted with glanders and was consequently sacrificed. I cut off the part of the incisive bones bearing the incisors, and, on closer examination, find that there is complete aplasia of the tooth in question. The middle incisor

of the right side and the intermediate of the left side are separated in their free portion by a space about 6 mm. in width. The body of the incisive bone of the left side is hypoplastic to such a degree that its width is 10 mm. less than the body of the corresponding bone on the opposite side, and the incisive foramen is displaced an equal degree to the left of the median plane.

A photograph of the specimen is here reproduced.

According to Goubaux and Barrier ("Exterior of the Horse"), diminution in the number of incisors has been reported rather infrequently. According to their records absence of the left upper nipper has been reported by only one observer, Megnin.

That the condition may often be overlooked, especially by those who have not acquired the habit of looking carefully into the horse's mouth, is evidenced by the fact that the mare to which reference is made above was the pet of two physicians, who had reared her and had driven her in their practice for three years.

RUPTURE OF THE PANCREAS IN A MARE.

By HUGH THOMSON, V. S., Newman Grove, Neb.

I was consulted on Aug. 14 in regard to a mare, as she would eat no grain; she eat grass and hay, and from what other information I could gain I diagnosed some trouble with the liver. She showed no pain at any time during her sickness. I prescribed eight powders of sodium chloride and sodium sulphate, and requested a report the next day, which the owner made, saying she was better. I prescribed eight more, and to report again, which he did, saying she was about the same and to call and see her. I found a bay mare, weight about 1150 lbs., pulse intermittent (around 40); mouth very sticky with saliva; tongue coated; dirty gray mouth; mucous membranes white, with yellowish cast; skin cold and lifeless, like tissue paper; drawing the hand over the eyes the pupils dilated, yellowish pale cast to sclerotic; heart's beat strong with metallic sound to each beat; feces in pellets the size of English walnuts, three or four to each bunch, clay colored; bowels paralyzed, not the least murmur. Diagnosed liver trouble, probably hypertrophy, with internal hæmorrhage of either the spleen or pancreas. Prognosis unfavorable. Treatment given all through case: Digitalis, nux, gentian, ammon. chloride, potass. iodide and sodium chloride; also ergot and rectal injections of saline solution; occasionally a dose of colchicum and jaborandi. Called next day;

swelling back of forelegs, slight swelling on breast and mam-mæ. Next day larger, no pain in pressing it; fullness around back of diaphragm; slight swelling below stifles back to the perineum, half way to hock; no pain; mouth clearing up, also tongue; Schneiderian membrane moist and pink; mouth getting healthy moisture; patient apparently improving; quite fullness in abdomen; stiffness leaving; can raise the head without falling. I failed to mention that she would stagger if her head was raised high. Eyes beginning to get normal; pupils contracted to normal size. I began to believe that I had made a mistake as to internal hæmorrhage, as the patient appeared improving; stepped lively; whinnied for the other horses; responded to all commands; eat some oats; fæces soft; pellets same size, showing bowels still paralyzed. Continued the saline injections every three hours; gave aloin capsule per rectum; kicked with both feet; so had to take up front foot and raise head; she had the appearance of a pretty lively horse. Swelling of left breast continued on abdomen and thighs. Treatment continued.

On the 25th owner advised a discontinuance of my visits. On the afternoon of the 27th the owner called, saying the mare had quit eating, otherwise about the same. I gave him some nitro-muriatic acid dilute, with instructions, and agreed to see her the next morning, which I did. I found the patient dead, which had occurred peacefully, without a struggle.

Now, the most remarkable part comes in the post-mortem: Pupils dilated, mouth pale. Incision through swellings brought clear colored fluid, like water; tissues of a golden color, like Nebraska creamery butter; muscles pale pink; no blood came from incisions. On opening the abdomen there was a large outpouring of blood. When it struck the ground there was quite a bead on it. I should judge a large wash-tub of blood poured out. The stomach and bowels were empty and white colored; spleen pale blue; liver clay colored and hard, showing no inflammation; weight 26 lbs. Pancreas torn, black, like burnt steak and hard; one mass of burnt black tissue, hardened; mesenteric glands black and hard, size of English walnut; ovaries black and hard; uterus and bladder pale and healthy. On opening the diaphragm the tendonous portion had inflammatory streaks all over it; muscular portion pale pink; no blood in any of the bloodvessels; heart pale pink, not a drop of blood in it; auricles white; lungs white and very light; heart and lungs picture of health; not a particle of blood in lungs.

Is it not remarkable the length of time life was sustained in this patient—two weeks or fourteen days? On the second day of treatment the pulse beat regularly, did not miss a beat. There is no doubt in my mind that the rectal saline solutions, with heart stimulants, kept this hopeless patient alive. When I quit calling, the patient began to fail, as the owner became neglectful in his attention. At no time were there any swellings in the front legs, and only in the hind from the hocks up to the body. These swellings were deathly feeling from the start; there was no fullness to them.

Never having seen an account of rupture of pancreas and hæmorrhage, I send the REVIEW readers this report of the case in full.

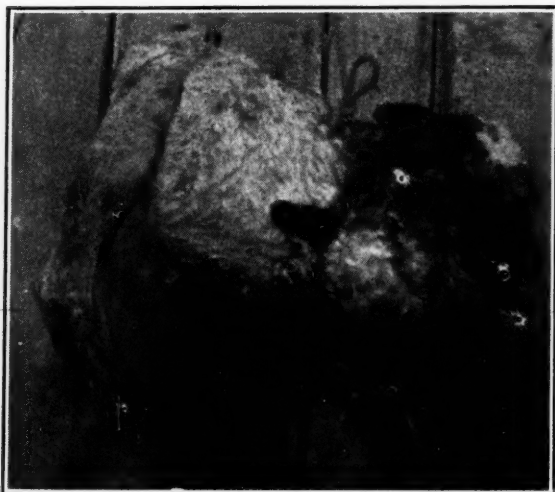
TWO CASES OF LOSS OF HOOFS FOLLOWING BILATERAL PLANTAR
NEURECTOMY FOR NAVICULAR ARTHRITIS.

By JOHN J. REPP, V. M. D., Philadelphia, Pa.

No. I.—Sorrel gelding, aged, brought to my clinic for treatment on account of being extremely lame in both fore extremities. The owner stated that he had been so for several years and that he was worthless to him in his present condition. I made a diagnosis of navicular arthritis and performed double plantar neurectomy on both fore limbs. After the operation he was able to move about with very little lameness. The horse was kept in the hospital 10 days and his feet soaked each day in a tub. At the end of this time he was taken home. The owner reported to me later that soon after taking the horse home his hoofs came off.

No. II.—Aged gray mare, very lame in the right fore limb, brought to my clinic by a man who had just traded for her, with the request that I nerve her to relieve the lameness. I made a diagnosis of navicular arthritis and proceeded at once to comply with his request by doing double plantar neurectomy on the very lame limb. Having done this the mare showed marked lameness on the other limb and he asked me to nerve that, which I did. The owner wanted to take her home as he did not want to incur the expense of keeping her at the hospital. I agreed to his doing this in case he would put her to pasture so that her feet might be kept soft by the dewes. A short time afterwards he reported to me that the mare's hoofs came off within two weeks after the operation.

A TWO-HEADED MONSTROSITY.



Dr. W. H. Gilbert, Leesburg, Ohio, sends the accompanying photo of a calf which he delivered on July 29, 1903, from a short-horn cow, 6 years old. Both front legs had to be removed at the body, and the heads being drawn close together, the dead foetus passed the

maternal passage after considerable traction.

THE SODA TREATMENT FOR AZOTURIA.

By W. P. HILL, Vet. 12th U. S. Cavalry, Batangas, P. I.

I have noticed from time to time in the different numbers of the REVIEW the varied treatments advocated for azoturia; so I feel like giving to my *confrères* my success with Dieckerhoff's treatment, *i. e.*, bicarbonate of soda.

When I first started practicing I used purgatives, bromide of potash and hot clothes, but had very little success until I read in an English journal the soda treatment.

Case I.—I had a "hurry-up" call, the farmer saying his horse had dropped in the river while passing through hitched to his wagon. On arriving I found they had pulled the horse out on the bank. I passed a catheter, which I always do. I then had the horse hauled up to the barn on a sled and made him as comfortable as possible with plenty of bedding, and started on the soda, giving him $\frac{1}{4}$ pound every 4 hours; no other medicament was used; I kept this up for two days; when next I saw him he was up and the owner led him home that evening.

Case II.—This horse dropped in a large mud hole in the main street of the town; I had him hauled to a nearby stable; passed catheter and started the soda as before; this animal was

very fat and weighed 1500 pounds and seemed to be a very serious case; she laid three days, but on the morning following I raised her with slings, and from then on she made a good recovery, stopping the soda after she stood up.

Case III.—This one is to impress the importance of passing a catheter: the farmer had started to town with a load of hay and had got within a mile of the city when his horse suddenly refused to put the near hind leg to the ground, swinging it and acting in great pain; a practitioner close by was called in, who diagnosed it as a fracture of the acetabulum and advised shooting. The owner, an old client of mine, before taking this advice came for me; she was down when I got to her; I examined per rectum for fracture, and not finding anything assuring, I passed a catheter and on seeing the urine I knew at once what I had to contend with. I gave her the soda treatment and sent her home two days later, a distance of 15 miles. I never let a horse lay over three days without trying to raise it, and while down I have them turned after each dose. In administering the soda I put, say, $\frac{3}{4}$ ii of the dry powder on the back of tongue and drench it down with a swallow of water, then repeat.

This of course is not by any means a new treatment. I simply wish to record my success with the Dieckerhoff method. Its inexpensiveness and simplicity is another benefit.

I could mention many more cases with similar results, which naturally makes me a strong believer in the alkaline treatment.

AN OLD HORSE STORY.—A colored lad was sent to the city to sell a horse. A man approached him and inquired the price, when the boy told him that his master had instructed him to get \$100 if he could; if not, to accept \$75. The prospective buyer asked as to his faults. "He hab free very bad faults." "What are they?" inquired the man. "Well," said the boy, "my boss don't like dis hoss becuse he am white, and de hairs gets all over his clothes." "What else?" "Well, whenever he drinks he drives his nose down deep into de trough, and dat wets de boss' leggins." "And what is the third fault?" "I fergets de third fault," said the boy. "Never mind; I'll buy him." After paying for the horse he led him to his barn, but in entering he struck heavily against the door, which caused the owner to examine his eyes, when he discovered the horse was totally blind. Meeting the boy a few days afterwards, the new owner said: "Say, boy, that horse you sold me is blind in both eyes." "Oh, yes, dat's so; dat's the third fault."

EXTRACTS FROM EXCHANGES.

BELGIAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

CONSIDERATIONS AND RESEARCHES ON THE PATHOGENY AND SEMEIOLOGIC VALUE OF SPRINGHALT [*Liénaux and Zwaenapoel*].—Springhalt is a functional abnormality which consists in the jerky, sudden flexion of one or both hind legs during locomotion. It is specially observed at the hock, whose somewhat convulsive play has peculiarly called the attention of observers, and according to Berton is under the dependency of the automatism of the tibio-tarsal angle, propriety of the hock joint to complete spontaneously without external active interference the motions of extension or of flexion, when arrived at a certain degree. Springhalt is not only the excessive flexion of the hock. If the exaggerated motion calls the attention more, it is first because it reaches in it a peculiar intensity, allowed by the joint itself, and also because the tarsal automatism gives it a striking convulsive character, and, again, because of the superficial situation of the hock, free from all muscular structure. In reality, most of the joints of the leg show the same functional disturbance, and the minute observation of facts will allow us to detect the presence of exaggerated flexions of the thigh and also of the phalanges. Springhalt then consists in the excessive flexion of the entire hind leg, resulting finally in its exaggerated shortening. Besides the flexion there is also a more or less marked abduction of the extremity. Etiology of springhalt is very obscure. There is one kind, essential, independent of all visible cause, and another symptomatic. This last is generally accompanied by lameness, has probably for origin a pain felt while the foot rests on the ground. But this symptom of pain is not sufficient to differentiate the two types. Lesions of the foot, of the coronet, diseases of the stifle, etc., may give rise to it. Many other conditions have been considered as causes, the shortening of the tendon or muscle peroneo-phalangeus, of the tibial aponeurosis, of the fascia lata, of the internal ligament of the patella, the sciatic nerves, the spinal cord, articular lesions, dry femoro-tibial arthritis, etc. Among the best admitted causes of

springhalt, such as: the lesions at the toe of the foot, those of the coronet, of the second and third phalanx, shortening of the extensor muscles, pseudo-luxation of the patella, etc., we find that they aid in reducing the flexion of the foot or of the stifle just as in laminitis of the fore-legs, in backing or walking in soft and rough ground, springhalt has all the appearances of a compensatory act. The horse accentuates the shortening of his leg, carrying it also in abduction, so as not to strike the ground when one or the other of the articulations is not acting sufficiently. "To the imperfect closing of the articular angle in fault, he makes good by the most extensive flexion of those whose action is still normal. The tarsal automatism completes the movement in a passive way and gives its jerky character." The authors have made numerous experiments which have given them satisfactory results, and have brought them to the conclusions that in all cases of springhalt there is an alteration which interferes with the shortening of the leg and that the examination of a horse with springhalt must be made on all the joints of the leg affected, except that of the hock, and that not only the joint itself must be examined, but also all the elements which act in the production of the motions occurring, such as nerves, muscles, tendons, etc.—(*Annales de Med. Vet.*, June, 1903.)

A CASE OF TORSION OF THE UTERUS IN A MARE [*Stien-non*].—A mare, pregnant, expected to deliver in about ten days, is taken with colic. A practitioner makes no positive diagnosis, gives antispasmodics, and, having no results, resorts to eserine and pilocarpine. As the animal grows worse, the author is called, and has no difficulty in diagnosing torsion of the uterus. The animal grows worse rapidly and dies. At the post-mortem the uterine lesions are extensive. The organ had made a double turn on itself; the twist involves the portion of the vagina immediately back of the neck, which is tightly closed. The walls of the uterus are congested and about two centimetres thick. The colt is well developed. The broad ligaments are stretched and are also twisted. Colics have been said to be the cause of torsion of the uterus, and *vice versa*. The author asks whether in this case there has been primitive colics due to another cause having preceded or promoted the torsion? and concludes that such was the case, that there were colics first and that it was in one of the struggles that the torsion took place. For him, however, the post-mortem has demonstrated that the only cause of the abdominal pains towards

the end of the suffering was in the uterine lesions and that those were the cause of death. This case shows once more that torsion of the uterus may give rise to colics exceptionally severe, even fatal, and that practitioners called to attend a pregnant mare must not only at the beginning of his attendance but also during his treatment assure himself of the condition of the genital organs.—(*Annales de Brux., May, 1903.*)

BACTERIAN ANTHRAX IN CALVES [*Stiennon*].—If calves are not refractory to symptomatic anthrax, infection is, however, an exception. Experimentors have shown that the calf is much less sensitive to artificial infection than older animals; he resists a dose of virus—deadly for an adult; would he resist as well to a natural infection? A four-months-old calf has refused his food in the morning; his temperature is 40°; along the right ilio-spinal muscle there is a large tumor, extending from the withers to the croup; it is œdematous on its surface and crepitates in its depth; it is very little painful and of temperature rather less than the surrounding parts. There is a similar tumor on the right gluteal region. Diagnosis: Suspicious of anthrax. At the slaughtering, lesions of anthrax are found in the muscles and spleen, which, with bacteriological examination, confirm it. Conclusions of the author: Considering the rapid march of the disease, is it not evident that the animal has a great susceptibility to the disease? And, again, is not the severity of the lesions during such a short period evidences of this susceptibility? Then, give to calf the occasion to be spontaneously inoculated with the bacillus Chauvii, and the lesions produced shall be as serious by their characters and their effects as they are in more aged bovines. If calf resists better to experimental infection, it does not seem to be less receptive than adults to natural infection, this giving rise in it to as great lesions and serious results.—(*Annales de Bruxelles, May, 1903.*)

DOSE OF ANTITETANIC SERUM IN NEW-BORN COLTS [*J. Nandrin*].—The efficacy of the serum as preventive of lockjaw is admitted by all. The author has had the opportunity to test it in a farm where the slightest wound was followed with this disease and with fatal results. Eight colts had died in five years on the place, three of which were new-born. Adults on the farm seemed to be refractory—why? In 1897 the owner consented to have all his stock, adults and new-born, submitted to the action of antitetanic serum, and since then lockjaw does not exist on the farm. In 1897 the first inoculation on a new-born was to be performed. But what was to be the dose? As

10 c.c. seemed dangerous, only 5 c.c. were given for the first injection, which the colt received 48 hours after birth. Ten hours later it was taken with very severe symptoms, but without trismus, or spasmodic contraction of the muscles; the legs were flexible, the membrana nictitans did not cover the eye, there was no hyperæsthesia. The colt was in lateral decubitus; unable to stand up; the pulse was thready, almost imperceptible; respiration accelerated and abdominal; no cough; defecation normal; temperature 39.6°. No treatment prescribed. Two hours later, the condition was improving and in a few hours after, it entirely recovered. The troubles were due to intoxication by the serum. The second injection, made ten days later, was of 3 c.c. only, and was followed by no bad results. Since that day that dose of 3 c.c. only is used—two injections being made, one 48 hours, the other on the twelfth day after birth.—(*Ann. de Bruxelles, Aug., 1903.*)

ITALIAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

ON THE IMPORTANCE OF PROGNOSIS IN VETERINARY MEDICINE [*Dr. E. Stragia*].—Called to attend a six-year-old horse suffering with very severe colic for an hour and a half, the author found his patient, one which had been some months previously operated for scrotal hernia at the clinic of the veterinary school of Pisa; he made a minute exploration of the inguinal region and found nothing abnormal. Rectal examination was also negative. As the animal was in great pain, laxatives were administered. The case was considered as one of stercoral colic. Improvement being very mild only, notwithstanding two injections of morphine, sulphate of eserine and pilocarpine were resorted to, but, as after waiting an hour no action took place, the diagnosis of intestinal obstruction was made, a very unfavorable prognosis given, and Dr. E. S. left him. A short while after came an empiric, who took the horse by the bridle, and, whip in hand, made him travel two good kilometres. The horse then was returned to his stall, and, after a few minutes, the drugs operated, defecation was abundant and the animal saved. . . . In another case, similar in symptoms, where purgatives, injections, anodynes, etc., and finally eserine and pilocarpine had been administered without results, and which after two days of treatment was considered as suffering with intestinal obstruction that laparotomy only could help.

The animal was then sold by the owner for 10 liras. Four days after the animal was in perfect health. . . . These two cases are recorded to show how one must be careful in making a prognosis, as often, notwithstanding all that is found in classical works, due to highest authorities, serious and unpleasant errors may be committed.—(*Il Nuovo Ercolani*, July, 1903.)

A CASE OF TETANUS—RECOVERY WITH PHENIC ACID [*Dr. Maccagni Guido*].—A horse fell down and wounded his knee; he was taken home with some difficulty and some fifteen days after exhibited some peculiarities for which the author was called. He is stiff all over, his head carried elevated, nostrils dilated, the membrana nictitans covers the globe of the eye, the animal eats with difficulty—he has tetanus. For treatment it was decided to resort to injections of phenic acid, which the owner consented to after consulting another veterinarian. A mixture of 2 grammes of pure phenic acid in 20 of glycerine was prepared and used in three doses—one in the morning, one at noon, the other in the evening. Then, again, 8 gr. of acid were given in a bolus morning and evening, and 40 grams of chloral in two litres of water administered by rectum. Ointment of potass. cyanide was rubbed over the masseters and neck. On the third day the chloral was stopped and replaced by 24 gr. of phenic acid in five litres of water. Improvement was slow, but after about two weeks the doses of phenic acid were gradually reduced and stopped. About 340 grammes of the acid had been given during the whole treatment. There was but one abscess formed as a consequence of the injections in the neck.—(*Il Nuovo Ercolani*, Sept., 1903.)

CONTRIBUTION TO THE STUDY OF SPAVIN [*F. Belli*].—The nature and development of spavin being still disguised, the author publishes the conclusions he has arrived at by the microscopical examination of the lesions observed in 22 hocks and taken from animals lame with spavin during life. The various alterations of the articular surfaces, sooner or later, end in ankylosis; and this, complete or incomplete, almost always does not involve the periphery of the joint. Notwithstanding the complete ankylosis of the bones of the base of the hock, there are in four of them only insignificant osteophytes; it is evident that the central ankylosis is not consecutive to peripheric lesions. Then, says the author, the arthritic process of spavin travels a centrifugal way. The attention of the author is called by a lesion "said to be constant" of the cartilages of incrustation of the tibio-astragalean joint; it is principally situated in the

groove of the astragalus and the corresponding tibial crest. This lesion has some relations of severity with the lesions of the astragalo-navicular joint. The osteophitic production is not limited to the internal side of the hock; it may extend to the periphery and to the tibia and metatarsal; therefore, the treatment of this affection must not be limited to the ordinary seat of the exostosis.—(*Il Nuovo Ercol. and Rev. Gen.*, October, 1903).

INTRAVENOUS INJECTIONS OF SUBLIMATE IN INFECTIOUS DISEASES [*Profs. Mariani and Da Monte*].—The following are the conclusions of the authors, after their experimental researches: Sublimate acts on the organism in increasing its resistance and promoting the formation of antitoxines, which allow it to resist either the toxines artificially produced or those from the inoculated microbes. The antitoxic power must be attributed to either a preventive vaccination, or a curative action toward the promoted intoxications. Weak doses of sublimate must be used and the injections repeated; too large doses act as a poison, adding its effect to those of the toxines. Solutions must be large to avoid phlebitis and thrombosis. Sublimate does not act as a bactericide, but as an antitoxic, and thus is explained why very weak doses are sufficient against intoxications and infections. Intravenous injections stimulate and increase the agglutinating properties of the serum of the blood and protect animals against fatal doses of bacterian toxines. Animals can be protected against experimental infections from diplococcus, streptococcus and bacteridia, if the sublimate is injected in veins in weak doses (1-50 of a milligramme to each kilogramme of living weight) and in very diluted solution. Preventive immunization can be granted, in giving animals repeated injections, 1-10 of milligramme, before the inoculation of a killing dose of toxine or of virus in the peritoneum—inoculated animals can be treated with still weaker doses of sublimate.—(*Il Policlino and Rev. Gen.*, Sept., 1903.)

ACTINOMYCOSIS IN A DOG [*Dr. Arnaldo Fumagalli*].—The author was called to see a terrier, six years old, which had a swelling on the left side of the upper jaw, corresponding to the root of the first molar. This swelling was hard, adherent to the bone, about the size of a nut. The dog was in pain, suffered much in eating. On opening the mouth the two first molars were found loose, to such extent that their extraction was very easy. In examining the bottom of the alveoli the yellow characteristic granulations of actinomycosis were suspected and fully recognized under the microscope. The treat-

ment recommended was that of tincture of iodine externally and iodide of potassium internally, but with what result is not known. How the dog got the disease was not told by the owner.—(*Clinica Veter.*, Aug., 1903.)

ENZOÖTIC MENINGO-ENCEPHALITIS IN FOWLS [*Dr. Arnaldo Fumagalli*].—A flock of 100 handsome fowls were in a large poultry yard, free from chicken cholera, although the disease prevailed in the district. One day five of the fowls took sick and died; the following days the same conditions occurred until finally the whole flock was destroyed. The following symptoms were observed: sudden attack; high fever; extreme weakness; staggering; entire loss of appetite; eyes partly closed; feathers standing; wings drooping; later on diarrhœa. The characteristic points are of nervous nature; there are disorderly motions of the head and neck; in some there were emprosthotonos, in others pleurosthotonos. Some of the birds rested the head on the ground, others were walking in circles. These conditions lasted but a few moments and soon the bird would resume its normal condition, yet death finally occurred. At the post-mortem nothing abnormal could be macroscopically observed. The central nervous system only showed extensive congested condition of the blood vessels of the cerebrum and cerebellum. The cerebral substance was softened; the ventricles contained an abnormal quantity of fluid. The author has not yet made the bacteriological examination and does not know if the infective agent is that of cholera or any other disease.—(*Clinica Veter.*, August, 1903.)

GERMAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

SADICAL LESIONS OBSERVED ON ANIMALS (*Prof. Fröhner*).—Under the name of sadism are gathered all the injuries occasioned in men or animals by individuals under the impulse of a depraved sexual desire. German bibliography is very poor on records relating to sadism, having animals for victims, but foreign literature contains numerous examples. Guillibeu has reported three interesting cases on cows, goats, and steers. In France many cases are also recorded. Recently F. Reichert has treated the question in his pamphlet "on the significance of sexual psychopathy of man in relation to veterinary medicine." He enumerates all the errors of diagnosis to which sadism has

given rise. Fröhner himself has described under the name of gangrenous epizootic œdema in bovines and ewes, an affection which he had observed recently and whose origin seemed to him mysterious. It is only later that he learned that this necrotic vaginitis and the septicæmia were the work of a sadic young man. The symptoms observed on 3 heifers, 2 cows and 16 ewes were: swelling of the anus and vulva, tenesmus, liquid diarrhœa with blood, tympanites, arched back, 136 pulsations, respirations 34; vulva and vagina infected presenting bloody striæ and brownish or black patches. Temperature at the rectum 39° , in the vagina $39^{\circ}3$. On each side of the loins, soft, cold, crepitating œdema. The cows died after 3 to 8 days, the heifers in 24 hours, the ewes lasted from 12 to 21 hours. At post-mortem the lesions were: complete absence of cadaveric rigidity, excessive inflammation of the anus, vulva and perineum; subcutaneous connective tissue of the kidney, loins and internal face of the thighs impregnated with greenish yellow liquid, clear and slightly odorant. Muscles soft; blood black, viscous, not coagulated. Petechia on the peritoneum; intestines normal except the rectum, which at half a metre from the anus was black and marked with greenish streaks and patches. Nothing abnormal in the spleen and kidneys. Pelvic muscles were greenish, puffy. Between the rectum and vagina there was a large clot of blood. The walls of the vagina, uterus and bladder were black and softened. Lungs and myocardium congested, pericardium and endocardium covered with hæmorrhagic spots. Fröhner had made a diagnosis of septicæmia following gangrene of the rectum, vulva and vagina. All the animals being dead and the barns well disinfected, the owner bought a mare in foal. She aborted abnormally after a few weeks. A week later this mare presented symptoms having much analogy to those presented by the animals that had died. The owner had to keep his animals a young fellow, 14 years old, kind of idiot, who made a full confession, and exhibited a stick with a sharp point, which was covered with blood. In his pamphlet, Reichert examining the legal side of sadism on animals says: "Whenever animals will be seen with wounds through manipulations from ill-disposed individuals, it will be necessary to look for the motive which has incited them. In general, the individual will say that it was to punish, to revenge himself; this is an explanation which may be plausible if the wounds are in any other region of the body except the sexual organs. But if these are the only ones injured, one is justified to conclude that

they were made under the impulse of a depraved sexual desire."—(*Deutsche Thier. Wochr. and Rev. de Med. Vet., Sept., 1903.*)

CROWS AS CONVEYING AGENTS OF EPIZOÖTICS OF FOWLS [*Dr. Robert Klee*].—When, in October, 1901, he assumed his duties at Jéna, the author was informed that in a forest close by there was a colony of crows, among which in the preceding spring, many had died by *Syngamus trachealis*. In the following winter, he had a number of crows killed and found the parasites in 50% of them. As cold weather is not favorable to the development of the syngamus, Klee found this percentage very large and came to the conclusion that the colony of crows was a very dangerous hotbed of syngamosis. Indeed, during the summer of 1902 he had occasion to observe an epizoöty of syngamosis among the pheasants of the Prince of S——, which were in the surroundings and which out of 3,500 birds killed 1,700. The treatment resorted to was : suppression of the drinking water, which was replaced by garlic decoction, kitchen salt was thrown freely in the places where the birds fed, and finally following the method of Mouquet : intratracheal injections of a solution of salicylate of soda 5% with probe carried in the larynx and trachea. In this way the epizoöty was arrested. Klee considered it due to the presence of the crows and compared it to a similar outbreak observed by Megnin.—(*Fordschritte der Veter. Hyg. and Rec. de M. Veter., Sept., 1903.*)

CANCER OF THE BLADDER IN HORSES [*Lehmeyer*].—The case is that of a heavy draught horse of 18 years, in good spirit, without fever and eating well. He has painful micturations, they occur about every half hour and are accompanied by the expulsion of a few drops of red urine. Tumor of the bladder was suspected. At the rectal examination, the bladder was found as big as a child's head and puffy in consistency. There was no fluctuation outside of a zone of the diameter of a hen's egg ; pressure at that point was followed by the expulsion of a bloody urine, containing clots of blood. The animal was sent to the butchery. At the post-mortem it was observed that the mucous membrane of the bladder, except where the fluctuation was detected by rectal examination, was invaded with masses of villousities, tumors half soft in consistency and bleeding on their surface. The microscopic examination showed the tumor to be an epithelioma with parimentous cells. There were no other localizations of the disease.—(*Wochens. fur Thiehr. and Revue Générale, Sept., 1903.*)

SURGICAL TREATMENT OF CHRONIC LAMINITIS IN HORSES

[*Hansen*].—The author has tried to find a remedy against this disease, true infirmity, which reduces so much the value of the animal affected with it. Besides the general ordinary treatment (aloes, pilocarpine, baths) he does not hesitate to recommend and perform the operation consisting in the removal of the sole. The operation is done with the most strict disinfection of the extremity of the leg. The sole is thinned out, the plantar face is exposed in the portion corresponding to the third phalanx, displaced more or less. Generally the tissues are found tumefied and bleeding on a level with the antero-inferior border of the os pedis. The wound is treated antiseptically with sublimate and iodoform. Repair goes on quickly; a wide-web shoe is placed on the operated foot. This treatment has been resorted to in three cases. The first in a mare which had laminitis after parturition; she was cured in seven or eight weeks. She had been sick five weeks when the treatment was resorted to. The other two animals were also cured in the same time.—(*Mauneds. for Drylueg and Rev. Gen., Sept., 1903.*)

TROTting RECORDS FOR THE YEAR.—Following are the records for 1903, as far as may be ascertained at this time: Trotting, two-year-olds, Grace Bond, 2:14 $\frac{1}{4}$, by The Bondsman; three-year-olds, Sadie Mac, 2:11 $\frac{1}{2}$, by Peter the Great, 2:07 $\frac{1}{4}$; four-year-old, Judge Green, 2:10 $\frac{1}{4}$, by Directum, 2:05 $\frac{1}{4}$, and Wainscot, 2:10 $\frac{1}{4}$, by Alcy Wilkes, 2:16 $\frac{3}{4}$; five-year-olds, Lou Dillon, 1:58 $\frac{1}{2}$; best by a mare, Lou Dillon, 1:58 $\frac{1}{2}$; best by a gelding, Major Delmar, 1:59 $\frac{3}{4}$; best by a stallion, Cresceus, 1:59 $\frac{3}{4}$; fastest new performer, Lou Dillon, 1:58 $\frac{1}{2}$; fastest to wagon, Lou Dillon, 2:00; fastest mile on half-mile track, Cresceus, 2:08. Pacing: Two-year-olds, Fata Morgana, 2:19 $\frac{1}{4}$, by Sphinx, 2:20 $\frac{1}{2}$; three-year-olds, Miss Daphne Direct, 2:11 $\frac{1}{2}$, by Direct, 2:05 $\frac{1}{2}$; four-year-olds, Hal Chaffin, 2:05 $\frac{1}{4}$, by Brown Hal, 2:12 $\frac{1}{2}$; five-year-olds, Bald Hor-net, 2:07 $\frac{1}{4}$; fastest mare, Dariel, 2:00 $\frac{1}{4}$; fastest gelding, Prince Alert, 1:57; fastest stallion, Dan Patch, 1:56 $\frac{1}{4}$; fastest new performer, Tom Keene, 2:04 $\frac{1}{4}$, by West Egbert, 2:29 $\frac{1}{4}$; fastest mile to wagon, Dan Patch, 1:57 $\frac{1}{4}$; fastest mile on half-mile track, Prince Alert, 2:03 $\frac{1}{2}$. To this string might be added the feat of Lou Dillon in pulling the old high-wheeled sulky in 2:05 on the Cleveland track, which is by no means the least important of the many wonderful performances chronicled this season.—(*Breeders' Gazette.*)

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

THE EDITORIAL ON THE ARMY VETERINARY SERVICE IN THE NOVEMBER "REVIEW" AND ITS EFFECT.

It was an unexpected pleasure to me, and doubtless so to every army veterinarian, to read the editorial on the "Army Veterinary Service" in the November REVIEW. It has shown us that the great body of veterinarians of the country still take an unabated interest in our future welfare as members of a branch of the profession that has undergone peculiar trials and tribulations; and it has also assured us that they will stand by us in the future as they have in the past, in a renewed effort to put the Army Veterinary Service on a serviceable basis to the Government and on a creditable foundation to ourselves as professional men.

It is true that any effort to right ourselves in our position in the Army must naturally come from within our own ranks, and if there has been any doubt as to the propriety of such a view, we were clearly shown by the War Department, by an explicit order, that this is the only proper way for us to pursue, if we wish to state our grievances and suggest an amelioration therefor.

We have, accordingly, taken the matter into our own hands in an endeavour to come to an understanding among ourselves as to what we need and what we deem expedient to suggest to our proper authorities. But we cannot be in a position to defend our proposition unaided by outside influence, after it has left the War Department even with its approval, and we must, therefore, be gratified to know that our colleagues in civil life are watching our efforts and are ready to help at such opportune time and occasion as are sure to arise.

This feeling must have been the impulse to an army veter-

inarian stationed in the East, from whom we have just received a circular letter asking for the opinion of all army veterinarians present in the States, whether he shall present a petition to the proper military authorities now, or at a later more opportune time, and asking sanction to the subject-matter suggested, which is drawn on a very modest basis, but happily, also, on a very just one.

We are not at liberty to mention the name of the author nor his suggestions, because we had no time to ask for permission to do so, but it may be said that he has had ample opportunity to inform himself directly of the present feeling at the War Department in regard to our position and its possible improvement. His suggestions are very much in the line of those set forth in the "Army Veterinary Department" for the past eight months, and as he has worked independently, but has arrived at nearly the same conclusion, our army colleagues should now clearly see the wisdom of advancing but a modest proposition, which on its face will bear nothing but urgent necessity and neglected justice. That the latter is such will be admitted from the fact that we have two army colleagues long past due the retirement age of the Army, one nearly seventy years of age, feeble and broken down in a long and arduous military service, and the other following him closely in years.

We believe that the frank editorial in the November REVIEW, which breathes a fine colleageal feeling for the army veterinarian, has had much to do in encouraging the move made by our army colleague, and if the matter is now given proper and immediate attention by all of us in the Army, we shall soon be again in the field for another trial in a just and needy cause.
(O. S.)

* * *

FOREIGN ARMY VETERINARY NOTES.

The *Veterinary Journal* (London) announces in its October number the opening of the "Department of Tropical Veterinary Medicine" of the Liverpool Institute of Comparative Pathology. Encouraged by its success in the study of tropical diseases of man, and by the remarkable speech of the late Professor Nocard, of Paris, delivered to the School of Tropical Medicine in Liverpool a few weeks before his death, and in which he emphasized the great national want of systematic training and research in tropical veterinary medicine, the Institute has now opened a veterinary department, the objects of which are set forth as follows :

1. To train veterinarians in the special subject of tropical diseases of animals.
2. To afford facilities for research in these diseases and organize expeditions for this purpose.
3. To organize preventive measures in the tropics against diseases of animals.

The course of instruction is as follows :

I. Lectures and clinical instruction in the diseases of animals in the tropics.

Bacterial diseases : Anthrax, black quarter, glanders, spirillum fever, the pasteurella, etc.

Diseases—cause unknown : Cow-pox, horse-pox, horse sickness, rinderpest, etc.

Blood parasite diseases : Trypanosomiasis, surra, nagana, dourine, mal de cadera, etc.

Other parasitic diseases : Coccidial diseases of animals—filariasis and other helminthiases ; skin parasites.

II. Laboratory instruction.

Technique and methods of examination of blood, secretions, excretions, etc.

Methods of immunization against diseases.

Testing of products for the prevention and cure of tropical animal diseases.

The laboratories occupy one floor of the Liverpool School of Tropical Medicine. Suitable accommodations for animals are provided at a nearby farm station. A museum on tropical veterinary medicine is being established.

Fees for course : ten guineas. Board and residence may be secured in the neighborhood of the Institute ; charges for a period of not less than two months £1 per week.

We have copied the essentials of the course in tropical veterinary medicine in the hope that someone of our young army veterinarians may see his way to attend the course at Liverpool. Anyone of us who has served in the Philippine Islands must see the immediate great purpose of such a course of special instruction. Our impotent struggle against glanders, surra, African farcy, rinderpest, and a number of skin diseases new to us, constitutes one of the darkest pages in the history of our army veterinary service. Not that we were entirely and alone to blame for such incompetency, for at times we were not asked at all, but instead the advice was taken of army surgeons or even of some officers "who were born and raised on a stock-range," and who knew all about these diseases by intuition, but

yet those of us who were earnestly seeking the truth and striving to do some sensible good, have heavily felt the gap in our knowledge as regards the causes, nature and the practical treatment of these tropical diseases. With the rush and confusion of the war now over, a veterinarian properly posted on tropical diseases of animals should have no difficulty in taking his proper seat in the councils of military or civil administration, and if his advice would be heeded, incalculable benefit must result to the Islands, which were devastated of their various domestic animals by the scourges mentioned. (O. S.)

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THE NEW "ROYAL WARRANT" OF THE ENGLISH A. V. D. JUST
PUBLISHED.

According to the *Veterinary Journal* (London), November, 1903, the new "Royal Warrant" reorganizing the English Army Veterinary Service has just been promulgated to the Army by the Secretary of State for War. It is in effect as follows :

WAR OFFICE, 9th October, 1903.

ROYAL WARRANT.

Army Veterinary Service.

EDWARD, R. I.—Whereas, we deem it expedient to amend the regulations relating to the promotion and pay of officers of our Army Veterinary Department ;

Our will and pleasure is that the Warrant of Her late Majesty, Queen Victoria, dated 26th October, 1900, as amended by Our Warrant dated 20th March, 1902, shall be further amended as follows :

Rank.

I. The substantive ranks of officers of our Army Veterinary Department shall be in future as follows :

Colonel, lieutenant-colonel, major, captain and lieutenant.

The following shall be inserted in article 320 :

As *major-general*—the colonel holding the appointment of director-general, A. V. D.

Appointment and Promotion.

434. A lieutenant shall be eligible for promotion to the rank of captain on completing five years commissioned service, provided that he has previously qualified as prescribed by our Secretary of State.

435. A captain shall be eligible for promotion to the rank of major on completing ten years service in the rank of captain, . . . provided that he has served three years abroad, and has previously qualified in such manner, etc.

436. Promotion to the rank of lieutenant-colonel shall be made by selection from majors, of not less than fifteen years service, who have served at least three years in India, and have previously qualified, etc.

437. Promotion to the rank of colonel shall be made by selection from lieutenant-colonels who have served five years in that rank.

Brevet Rank.

438. An officer of our A. V. D. shall be eligible for promotion to brevet-rank under condition laid down in article 36.

Instruction : Distinction in original investigation or research may, in the case of an officer of our Army Veterinary Department, be regarded as "distinguished service of an exceptional nature other than in the field," within the meaning of article 36.

Pay and Charge Pay.

439. (We leave out the schedule of pay, half-pay, and retirement pays, as it is quite lengthy. The director-general receives £1,200 a year.)

Conditions of Retirement on Account of Age.

586. The director-general shall retire on completion of three years' service as such ; the retirement of colonels shall be compulsory at the age of fifty-seven, of lieutenant-colonels at the age of fifty-five, and of majors at the age of fifty-five, or after 28 years of service if they have previously been passed over for promotion to lieutenant-colonel, provided that in no case shall they serve beyond the age of fifty-five.

Conditions of Retirement on Account of Medical Unfitness.

588. An officer of our Army Veterinary Department placed on the half-pay list on account of medical unfitness shall, if not previously retired on account of age, be retired from our Army at the expiration of five years from the date on which he was placed on the half-pay list, or if reported by the medical authority to be permanently unfit for duty, at such earlier date as may be decided by our Secretary of State.

It is our further will and pleasure that the non-commissioned officers and men of the Army Veterinary Service shall be formed into a corps, to be designated the "Army Veterinary Corps," and shall be graded as follows :

Farrier-quartermaster-sergeant.

Staff-farrier-sergeant.
Farrier-sergeant.
Shoeing-smith-corporal.
Shoeing-smith.
Private.
Given at our Court, etc.

By His Majesty's Command.

ST. JOHN BRODERICK,
ROBERTS, F. M.

Commander-in-Chief.

[NOTE: By this Royal Warrant the English Army is the first to have a veterinarian with the rank of major-general.

(O. S.)]

DIGESTION OF SUGAR AFTER REMOVAL OF THE PANCREAS.—Lüthje has experimented on dogs and removed every vestige of the pancreas, including even the duodenum. Even after this operation, the animal did not entirely lose the power of digesting sugar, especially after he had been placed upon starvation diet.

OPPORTUNITIES FOR VETERINARIANS IN MONTANA.—In Montana there are a number of locations for veterinary surgeons that should be desirable, and since Montana has a meat and milk inspection law under State control, it is likely that competent veterinarians locating in these cities would ultimately receive appointments as meat and milk inspectors, particularly since under this law it is believed that such positions can only be filled satisfactorily by competent veterinarians. The most desirable of these locations at the present is Missoula, in Missoula County; Kalispell, in Flathead County; Great Falls, in Cascade County, and Billings, in Yellowstone County. The salary for the position of meat and milk inspector in Cascade County is \$1,500 a year; Missoula County, \$1,200 a year; Flathead County, \$1,000, and Yellowstone County, \$750 a year. Montana should offer in a number of localities good paying prospects for competent men. It is said that the meat and milk inspection positions can only be offered to those taking up their residence in the State. That loyal veterinarian, Dr. M. E. Knowles, of Helena, is Secretary of the Meat and Milk Inspection Commission, and we advise anyone wishing to avail himself of this opportunity to write to him, and he will undoubtedly furnish all the information and assistance which he can, as he is devoted to the success of the new law.

BIBLIOGRAPHY.

TEXT-BOOK OF VETERINARY MEDICINE. By James Law, F. R. C. V. S., Director of the New York State Veterinary College, Cornell University, Ithaca, N. Y. Vol. V., Parasites, Parasitism, etc. Ithaca : Published by the author, 1903.

With Vol. V., Prof. Law has completed the great undertaking to which he has devoted so much study and work for a number of years past, and has accomplished the great task of giving to the English-speaking veterinarian a comprehensive and modern treatise upon the whole range of veterinary medicine. It is the most pretentious work in our language, covering a greater variety of subjects, and bringing each subject down to the most recent researches and embodying the advanced conception of the etiology of diseases, together with the prophylactic and therapeutic measures for their prevention and cure.

The REVIEW has on different occasions referred to the four preceding volumes as they were published, and has advised its readers that they should have this system of medicine in their libraries, because there is scarcely a single subject to which they could desire to refer that is not fully covered. And the present volume is fully up to the standard of its predecessors. The author is an authority upon the subject of parasites, and his classification of the many varieties is probably the most exhaustive in our literature.

After giving a comprehensive chapter upon "Parasites and Parasitism," treating of their life history and characteristics, he successively takes up the different families and the diseases which they engender, and it would seem that there could be no circumstance connected with the subject which the author has failed to comprehend and record. Each page bears evidence of the most thorough and searching investigation, which is put together in systematic and regular order.

At the close of this volume there is added a general index of the whole work, which is so complete that it would seem that when any subject is sought it can be found with the slightest trouble.

We repeat that Prof. Law has fairly won the applause of his colleagues throughout the English-speaking world, and we have no doubt that his work will take its place in every library that aspires to hold the very best books that our literature can boast of.

DR. SCHWARZKOPF, U. S. Army, has a letter in the *Breeder's Gazette*, of Nov. 25, on "Requirements of a Cavalry Horse."

BUREAU OF ANIMAL INDUSTRY.

**PROMOTIONS OF VETERINARIANS FROM JANUARY 1 TO JUNE
30, 1903, INCLUSIVE.***From \$2,000 to \$2,500.*

Dr. T. A. Geddes, Special Inspector of Live Stock for Importation, London, England.

Dr. R. W. Hickman, Washington, D. C.

From \$2,000 to \$2,250.

Dr. W. H. Rose, inspector in charge of export animals and vessels, New York, N. Y.

From \$1,600 to \$1,800.

Dr. U. G. Houck, Washington, D. C.

Dr. Rice P. Steddom, Boston, Mass.

Dr. Henry J. Washburn, Washington, D. C.

From \$1,500 to \$1,600.

Dr. B. P. Wende, inspector in charge, Buffalo, N. Y.

From \$1,400 to \$1,600.

Dr. John S. Buckley, Washington, D. C.

From \$1,400 to \$1,500.

Dr. Louis Abel, New York, N. Y.

Dr. H. B. Adair, Kansas City, Kansas.

Dr. F. W. Ainsworth, inspector in charge, Pittsburg, Pa.

Dr. M. O. Anderson, inspector in charge, Austin, Minn.

Dr. Thomas L. Armstrong, Indianapolis, Ind.

Dr. Boyd Baldwin, inspector in charge, Cudahy, Wis.

Dr. R. J. Blanche, inspector in charge, Marshalltown, Iowa.

Dr. Frederick Braginton, inspector in charge, Bloomington, Ill.

Dr. Thomas A. Bray, El Paso, Texas.

Dr. Henry Brister, New York, N. Y.

Dr. Thomas W. Carnahan, Boston, Mass.

Dr. Lowell Clarke, Salt Lake City, Utah.

Dr. Frank L. DeWolf, inspector in charge, Topeka, Kansas.

Dr. Robert Darling, inspector in charge, San Diego, Cal.

Dr. George Ditewig, inspector in charge, Davenport, Iowa.

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Dr. E. P. Dowd, inspector in charge, Worcester, Mass.

Dr. A. T. Everett, South Omaha, Neb.

Dr. Nathan K. Fegley, inspector in charge, New Haven, Conn.

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Dr. Benjamin Howes, Buffalo, N. Y.

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Dr. James Johnston, Boston, Mass.

Dr. Charles Keane, inspector in charge, Los Angeles, Cal.

Dr. James S. Kelly, inspector in charge, Quincy, Ill.

Dr. Robert L. Kelly, National Stock Yards, Ill.

Dr. Peter I. Kerschner, Topeka, Kansas.

Dr. F. D. Ketchum, inspector in charge, South St. Paul, Minn.

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Dr. Arthur B. Morse, inspector in charge, Des Moines, Iowa.

Dr. Patrick H. Mallowney, Boston, Mass.

Dr. Wilbur J. Murphy, inspector in charge, Brightwood, Mass.

Dr. John P. O'Leary, Buffalo, N. Y.

Dr. Harry D. Paxson, inspector in charge, Fort Worth, Texas.

Dr. Louis A. Robinson, Buffalo, N. Y.

Dr. W. A. Savage, Chicago, Ill.

Dr. Trajan A. Shipley, inspector in charge, Cedar Rapids, Iowa.

Dr. William C. Siegmund, Chicago, Ill.

Dr. O. W. Snyder, Indianapolis, Ind.

Dr. Harry Q. Thompson, Boston, Mass.

Dr. Frank S. Tufts, Chicago, Ill.

From \$1,200 to \$1,400.

Dr. Nelson V. Boyce, Kansas City, Kansas.

Dr. Henry E. Brown, Boston, Mass.

Dr. D. Clifton Burnett, National Stock Yards, Ill.

Dr. Emerson J. Cary, Boston, Mass.

Dr. Clarence A. Clawson, Dalhart, Texas.

Dr. Willis I. Dillingham, Chicago, Ill.

Dr. Clarence O. Durfee, Boston, Mass.

Dr. William R. Fleming, South Omaha, Neb.

Dr. Ernest J. Foreman, Trinidad, Colo.

Dr. Warren J. Fretz, Rushville, Neb.
Dr. Duncan R. Gillies, St. Louis, Mo.
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Dr. Robert Turnbull, Indianapolis, Ind.
Dr. Harry K. Walter, Indianapolis, Ind.

CORRESPONDENCE.

AS TO THE SOLUTION OF COLLARGOLUM.

PROSPECT, OHIO, Nov. 16, 1903.

Editors American Veterinary Review:

DEAR SIRs:—An error crept into my communication on collargolum, which was published in the REVIEW some months ago. Instead of it being $\frac{1}{2}$ oz. collargolum dissolved in 8 oz. of distilled water, it should read: $\frac{1}{2}$ oz. collargolum dissolved in 24 oz. of distilled water.

Kindly correct same in next REVIEW, if convenient, and oblige,

Yours sincerely,

W. E. A. WYMAN.

OBITUARY.

DR. JAS. H. POWERS, a well known veterinarian of Providence, R. I., died of Bright's disease in that city, Oct. 18th, 1903.

He was a graduate of the Ontario Veterinary College and a member of the Rhode Island Veterinary Medical Association.

SOCIETY MEETINGS.

GENESEE VALLEY VETERINARY MEDICAL ASSOCIATION.

A meeting of this Association was held at the Hotel Gerard, Rochester, N. Y., Oct. 15, and was called to order at 10.30 A. M. There were present Drs. D. P. Webster, Hilton; J. W. Corrigan, Batavia; G. C. Kesler, Holley; A. George Tegg, Rochester; J. C. McKenzie, Rochester; L. R. Weber, Rochester; Carl Weber, Rochester; J. H. Taylor, Henrietta; A. McConnell, Brockport; P. J. Johnston, Williamson; W. B. Switzer, Oswego; and W. E. Stocking, Medina.

The morning session included the routine business of the Association. There was interesting discussion on the subject of illegal practice, which resulted in a motion, which was carried, authorizing the appointment of a committee to take this matter in charge and make plans to proceed against illegal practitioners.

After much discussion on various subjects of interest to the profession, the meeting adjourned to meet at the veterinary hospital of Dr. A. George Tegg at 2 P. M., at which place a very interesting clinic was held. The operations included the removal of a large tumor from the shoulder of a horse, which was very skilfully done by Dr. J. W. Corrigan. Dr. A. George Tegg, assisted by Dr. J. H. Taylor and others, very successfully removed several fungoid growths from the superior cervical region of a horse. Dr. Corrigan demonstrated the value of a new style of molar cutters, which worked to perfection. Dr. G. C. Kesler became very enthusiastic over his ability to administer restraint in minor demonstrations with the twitch.

After a great deal of discussion upon the above operations and the skilfulness with which they were performed, the meeting adjourned at 4.30 P. M. W. E. STOCKING, *Secretary*.

ONTARIO VETERINARY COLLEGE MEDICAL SOCIETY.

The above society held its first meeting of the session of 1903-04 in the lecture hall of the college, Friday evening, Oct. 16, at 7 o'clock, and was called to order by the chairman, Prof. C. H. Sweetapple, with Dr. W. R. J. Fowler acting secretary. Following the opening address by Prof. Sweetapple, the

Society proceeded to elect officers for the year as follows :

Secretary—S. Murray.

Assistant Secretary—T. F. Krey.

Treasurer—W. Martin.

Librarian—A. B. Sexmith.

Following the election of officers, the meeting proceeded to the presentation of the papers, as follows : "Enteritis," C. Dauber ; "Amputation of Uterus," E. J. Peck ; "Parturient Apoplexy," J. Badgley ; "Fibroma,"* T. F. Krey ; "Eversion of Uterus," F. F. Consoul ; "Fracture of Os Suffraginis," J. A. Black ; "Difficult Parturition," W. W. Warnock ; "Ventral Hernia," C. Spring.

The paper read by Mr. Badgley on parturient apoplexy proved a particularly interesting one, and was generally discussed. All the papers were fully considered and discussed, and the meeting was voted to have been an instructive and profitable one to all present.

The meeting then adjourned until Friday evening, October 23.
S. MURRAY, *Secretary*.

NORTH DAKOTA VETERINARY MEDICAL ASSOCIATION.

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President—Dr. S. P. Smith, Cando.

Vice-President—Dr. J. W. Robinson, Coal Harbor.

Secretary—Dr. E. J. Davidson, Grand Forks.

Treasurer—Dr. B. C. Taylor, Hillsboro.

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Society proceeded to elect officers for the year as follows :

Secretary—S. Murray.

Assistant Secretary—T. F. Krey.

Treasurer—W. Martin.

Librarian—A. B. Sexmith.

Following the election of officers, the meeting proceeded to the presentation of the papers, as follows : "Enteritis," C. Dauber ; "Amputation of Uterus," E. J. Peck ; "Parturient Apoplexy," J. Badgley ; "Fibroma,"* T. F. Krey ; "Eversion of Uterus," F. F. Consoul ; "Fracture of Os Suffraginis," J. A. Black ; "Difficult Parturition," W. W. Warnock ; "Ventral Hernia," C. Spring.

The paper read by Mr. Badgley on parturient apoplexy proved a particularly interesting one, and was generally discussed. All the papers were fully considered and discussed, and the meeting was voted to have been an instructive and profitable one to all present.

The meeting then adjourned until Friday evening, October 23.
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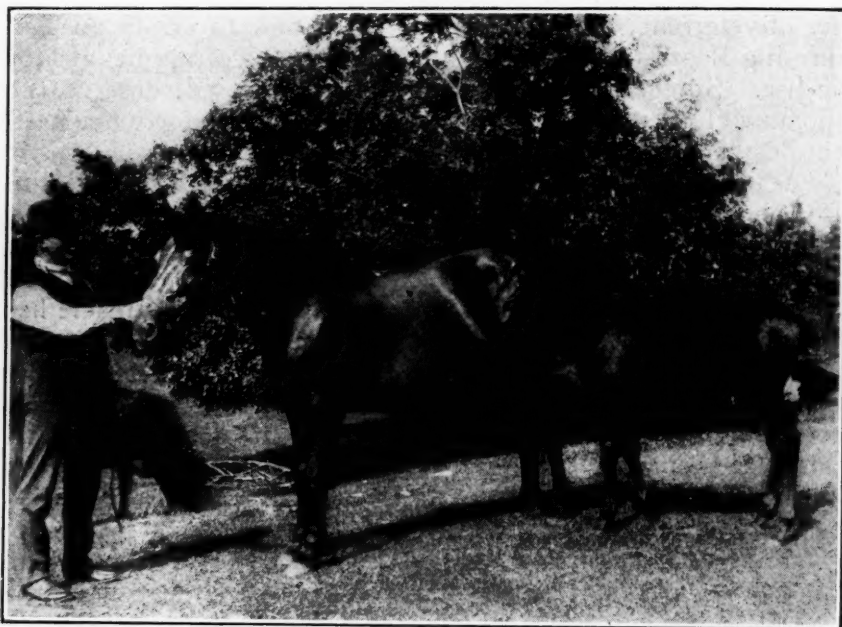
year, and that everything points to a splendid programme.

DR. E. M. RANCK, Resident State Secretary of the American Veterinary Medical Association for Mississippi, located at Natchez, is busily engaged in an effort to secure the passage of a bill through the Mississippi Legislature, to regulate the practice of veterinary medicine in that State, and to create an Examining Board to pass upon the qualifications of applicants for license. Surely if Dr. Ranck is successful he will deserve the applause of his colleagues, everywhere, and thenceforth one need not despair of any territory.

ACKNOWLEDGING MOLASSES AS A VALUABLE STOCK FOOD.—From experiments which have been carried on this year in different places there is no longer any doubt that treacle or black-strap molasses may be used as a horse food with much profit. From time immemorial a limited amount of treacle has been in use by old country feeders, and some have even gone the length of using it largely when diluted with water to take the place of turnips. But in this way its use was merely a makeshift and as such the feeding value of treacle has not until this year been fully determined. From what has already been published it appears that cut hay and molasses may be relied on with a very little grain to carry horses through winter in good fix. The approved method of feeding this substance is to cut the hay into half or three-quarter inch lengths, reduce the treacle with warm water till there is sufficient volume of it, then dampen down the mass of hay and feed, scattering over it any ground grain it may be desired to add. Or the hay and treacle may be fed alone and the dry grain as a separate ration. It would be well for some trials to be made on farms this winter with this foodstuff. If it is economical the fact should be known. Molasses is not dear, from 12 to 18 cents the gallon being spoken of as the price of the New Orleans product best suited to the work. Veterinarians have recommended that a start be made with a pound of the sweet stuff per day and a gradual increase till 12 pounds or thereby are being fed as described.—(*Breeder's Gazette.*)

CONTRIBUTION TO THE STATISTICS OF LONGEVITY AND PREPOTENCY.—A few months ago we published a letter from Mr. G. Stringer, of Bouckville, N. Y., concerning a mare owned by him which was then in foal, at the age of thirty-eight years. Since then we have received from the owner a photograph of this remarkable animal with her foal by her side, of which the accompanying half-tone is a reproduction. In a note

from Mr. Stringer, for whose integrity we vouch, he says that she is safely with colt again. The mare is not without an interesting history, as she was driven by the superintendent of the work driving over the line at the building of the Broadway (New



York) horse car railroad, which was completed in 1884. She is named "Black Bird," 38 years old, her colt now about five months old, and she is in her fifth month of gestation. Her appearance in the picture does not indicate her extreme age.

DR. SALMON STRAIGHTENS OUT MATTERS FOR THE "BREEDER'S GAZETTE."—The following letter, which appeared in the *Gazette* for Nov. 4, explains itself: "*To the Gazette*: The editorial in your issue of Aug. 5, entitled 'Confirming Koch's Views' was read by me with much interest and certain apparent inaccuracies in it would have been pointed out sooner but that it appeared best to wait for the full text of the communication made by Dr. Kossel, the head of the German commission appointed to investigate the subject of human and animal tuberculosis. The editor says: 'Scientists move slowly. Pseudo-scientists jump at conclusions. . . . Where Koch is best known his opinions carry greatest weight, and when he declared that the danger of the transmission of tuber-

culosis from bovines to humans was so slight that it might be wholly disregarded, his pronouncement met with the respect which the utterances of a true scientist always command from honest co-laborers.' This may be literally accepted, but it is not to be concluded from such remarks that Koch's views relative to human and bovine tuberculosis were accepted either by the leading authorities on tuberculosis or by the congress at London, where his paper was read. Such men as Lister, McFadyean, Nocard and Ravenel at once challenged the conclusion, and the congress passed a resolution which was not at all favorable to Koch's ideas. Since that congress numerous investigators have proved that Koch was wrong and that human tuberculosis might easily be transmitted to cattle. As his failure to infect cattle with human tuberculosis was the basis of his conclusion that people could not be infected with bovine tuberculosis, his principal argument has thus been refuted. It is interesting, however, to examine the report of the German commission, which was apparently dominated by Koch and which has shown itself very favorable to him. It should be borne in mind that these investigations were made to throw light upon the question as to whether bovine tuberculosis can be communicated to mankind. Koch in his address at London stated that human tuberculosis could not be communicated to cattle by any method and referred particularly to the method which you are pleased to call "the forcible inoculation of germs into the system by means of subcutaneous injections." It was this method which he singled out as the one best suited to discriminate between the germs of human and of bovine tuberculosis. Human tubercle bacilli, he asserted, when inoculated into cattle in this manner would not produce disease, while bovine bacilli inoculated in this manner would produce a progressive and fatal disease. Consequently, to decide whether any given person had been infected by the human bacilli or the cattle bacilli, he said this method should be used; and if by inoculating the bacilli from such a person no disease was produced in the cattle it showed that that person had been infected with human bacilli; but if, on the other hand, these bacilli produced a serious disease in the cattle, then it showed that the person in question had been infected with bovine tuberculosis. Now if this method was wrong your reflections against it and your statement that inoculation by such injections is a breaking down of all of Nature's prophylaxis simply reflect upon Koch and discredit the very witness whom the *Gazette* has cited to prove

its case. Let us see what were the results obtained by this German commission, as reported by Dr. Kossel. The *Gazette* says that according to the telegraphic report, 'in 35 cases utter failure characterized the efforts to convey human tuberculosis to calves by means of subcutaneous injections of cultures.' The number of cases of human tuberculosis investigated, according to Kossel, was 39, and what he actually said was that 19 of these did not produce the slightest symptoms in cattle. That is in about 49 per cent. or something less than half of the cases, no effects were produced. This is quite different from 90 per cent., as given in the telegram. Of especial interest is the statement with regard to the cases of tuberculosis in children which were investigated. Sixteen cases in all were tested by Koch's method to determine whether the children had been infected with cattle tuberculosis or human tuberculosis. The inoculations from four of these children produced progressive and generalized tuberculosis in cattle; and according to the principles laid down by Koch these four children must have been infected with bovine tuberculosis. That is to say, 25 per cent. of the cases of tuberculosis in children which this commission has investigated, proved to be infection from bovine sources. Now whether this is more or less than some people have supposed, it is certainly a sufficiently high percentage to merit the careful consideration not only of those who are specially interested in sanitation, but of cattle producers and dairymen as well. There are a large number of children who die of tuberculosis, and if it should prove on further investigation that anything like 25 per cent. of these cases were caused by infection from cattle, it would be a most serious matter. I bring this to your attention because the *Gazette*, in its editorial, entirely missed the real object of the experiments, which was to determine whether or not the cases tested were due to infection from man or from animals. The commission apparently accepts the results of these experiments, and admits that the four children in question were affected with bovine tuberculosis, as Kossel said: 'On the other hand it must be said, if the opinion of Koch is justified, that only perlsucht (bovine) bacilli are able to produce in cattle a progressive tuberculosis, we must admit that the children with whom we are here concerned were killed by perlsucht (bovine) bacilli.' The reader can easily decide for himself to what extent these experiments confirm Koch's views as expressed at London. D. E. SALMON, *Bureau of Animal Industry.*"

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table will be found the dates, places or meeting, and Secretaries' names and addresses of all the Veterinary Medical Associations of the United States and Canada, so far as obtainable by the REVIEW. Secretaries are urgently requested to see that the organizations which they represent respectively are included in the list, and that the details concerning them are properly stated. We shall be glad to receive notification of errors of commission and omission, to the end of making this department absolutely without fault, and thus a great help to the profession and the cause of veterinary science.

Name of Organization.	Date of Next Meeting.	Place of Meeting	Name and Address Secretary.
American V. M. Ass'n.	Aug. 16-19, '04.	St. Louis, Mo.	J. J. Repp, 5249 Addison St., Phila., Pa.
Vet. Med. Ass'n of N. J.	Jan. 14, 1904.	Trenton.	G. W. Pope, Athenia, N. J.
Connecticut V. M. Ass'n.	Feb. 2, 1904.	Hartford.	B. K. Dow, Willimantic.
New York S. V. M. Soc'y.	September, 1904	Brooklyn.	W. H. Kelly, Albany, N. Y.
Schuykill Valley V. M. A.	3d Wednesday in December.	Reading.	W. G. Huyett, Wernersville, Pa.
Passaic Co. V. M. Ass'n.	1st Tuesday of each month.	Paterson, N. J.	W. G. Fredericks, Delawanna, N. J.
Texas V. M. Ass'n.	Call Ex. Com.	.....	H. D. Paxson, Ft. Worth.
Massachusetts Vet. Ass'n.	Monthly.	Boston.	F. J. Babbitt, Lynn, Mass.
Maine Vet. Med. Ass'n. ....	.....	.....	C. L. Blakely.
Iowa-Nebraska S. V. M. Ass'n.	.....	.....	.....
Central Canada V. Ass'n. ....	.....	Ottawa.	W. W. Boucher, Ottawa.
Michigan State V. M. Ass'n.	Feb. 2, 1904.	Lansing.	Judson Black, Richmond.
Alumni Ass'n N. Y.-A. V. C.	April, 1904.	141 W. 54th St	F. R. Hanson, N. Y. City.
Illinois State V. M. Ass'n.	Dec. 2 and 3, '03	Sherm'n H'se Chicago.	W. H. Welch, Lexington, Ill
Wisconsin Soc. Vet. Grad.	Call of Pres't.	Racine.	S. Beattie.
Illinois V. M. and Surg. A. ....	.....	.....	W. A. Swain, Mt. Pulaski, Ill
Vet. Ass'n of Manitoba. ....	.....	.....	F. Torrance, Winnipeg.
North Carolina V. M. Ass'n. ....	.....	.....	J. W. Petty, Greensboro.
Ontario Vet. Ass'n. ....	.....	.....	C. H. Sweetapple, Toronto.
V. M. Ass'n New York Co.	1st Wednesday of each month.	141 W. 54th St	C. E. Clayton, N. Y. City.
Ohio State V. M. Ass'n.	Jan. 12-13, '04.	Columbus.	W. H. Gribble, Washington C. H.
Western Penn. V. M. Ass'n.	1st Wednesday of each month.	Pittsburgh.	F. Weitzel, 100 Parkway, Allegheny.
Missouri Vet. Med. Ass'n.	1904	Call of Officers	B. F. Kaupp, Kansas City.
Genesee Valley V. M. Ass'n. ....	.....	.....	W. E. Stocking, Medina, N. Y.
Iowa State V. M. Ass'n.	Call of Pres't	Des Moines.	H. C. Simpson, Denison, Ia.
Minnesota State V. M. Ass'n.	Jan. 21, 1904.	St. Paul.	J. S. Butler, Minneapolis.
Pennsylvania State V. M. A.	March, 1904.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila.
Keystone V. M. Ass'n.	2d Tuesday of each month.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila.
Colorado State V. M. Ass'n. ....	.....	.....	M. J. Woodliffe, Denver.
Missouri Valley V. Ass'n. ....	.....	Kansas City.	B. F. Kaupp, Kansas City.
Rhode Island V. M. Ass'n.	January, 1904.	Providence.	T. E. Robinson, Westerly, R. I.
North Dakota V. M. Ass'n.	2d Tues. Jan.	Grand Forks.	E. J. Davidson, Grand Forks

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ASIDE from the space which we have by courtesy extended to one of our permanent advertisers in which to reproduce one of the many complimentary letters which they are constantly receiving from members of the veterinary profession who have learned of their products through the REVIEW, we give over the entire department this month to advertisements; to which we would direct the attention of our readers, as they are interesting in character and may prove of value to some one.

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